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DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1989

HEARINGS

BEFORE THE

COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE

ONE HUNDREDTH CONGRESS

SECOND SESSION

ON

S. 2355

AUTHORIZING APPROPRIATIONS FOR FISCAL YEAR 1989 FOR MILITARY ACTIVITIES OF THE DEPARTMENT OF DEFENSE, FOR MILITARY CONSTRUCTION, AND FOR DEFENSE ACTIVITIES OF THE DEPARTMENT OF ENERGY, TO PRESCRIBE PERSONNEL STRENGTHS FOR SUCH FISCAL YEAR FOR THE ARMED FORCES, AND FOR OTHER PURPOSES

PART 4
CONVENTIONAL FORCES AND ALLIANCE DEFENSE

MARCH 21; APRIL 13, 14, 1988

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DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1989

MONDAY, MARCH 21, 1988

U.S. SENATE,
SUBCOMMITTEE ON CONVENTIONAL FORCES
AND ALLIANCE DEFENSE,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

REQUIREMENTS AND PLANS FOR CLOSE AIR SUPPORT MODERNIZATION

The subcommittee met in open session, pursuant to notice, at 9:38 a.m., Senator Carl Levin (chairman) presiding.

Present: Senators Levin, Dixon, Thurmond, and Quayle.

Staff present: Romie L. Brownlee, deputy staff director for the minority; and Christine C. Dauth, chief clerk; Richard D. Finn, Jr., John J. Hamre, George K. Johnson, Jr., and Daniel J. Wildfong, professional staff members; Cindy Pearson, staff assistant.

Also present: Gregory J. Weaver, assistant to Senator Levin; Charles C. Smith, assistant to Senator Dixon; Milton D. Beach, assistant to Senator Glenn; Terrence M. Lynch, assistant to Senator Shelby; William J. Wight, assistant to Senator Warner; and Henry D. Sokolski, assistant to Senator Quayle.

OPENING STATEMENT OF SENATOR CARL LEVIN, CHAIRMAN

Senator LEVIN. The subcommittee will come to order. We are going to proceed even though one or two of our witnesses have been delayed. Apparently the bridges have iced up or something.

Our court reporter has not been able to arrive here either because of the weather. But we are going to begin anyway, and we will tape the proceedings until the court reporter arrives.

The purpose of this hearing is to receive testimony on a key issue of force modernization that gets to the heart of our conventional defense capabilities; namely, the ability of our military services to work jointly.

The subject of the hearing is the modernization of close air support aircraft. One of the most important missions of the Air Force—and arguably one of the toughest missions to fly—is the close air support mission. Close air support has been the hallmark of combined operations and is one of the key ways the United States uses qualitative superiority to offset Soviet quantitative advantages.

The key question we face is whether DOD is paying adequate attention to the need to modernize close air support aircraft. Some defense critics charge that the Air Force really does not care about the close air support mission. In fact, the Air Force is directing some $13 billion to develop a follow-on aircraft for the F–15, which is arguably the finest aircraft in the world, but is devoting virtually nothing to develop a follow-on to the A–10, which is the current primary close air support aircraft. That type of disparity fuels the criticism offered by others that the Air Force does not care enough about close air support.

To help us sort through these problems, we have a distinguished group of representatives from various parts of the DOD. Mr. Don Fredericksen will be joining us. He is not yet here. He is the Deputy Under Secretary for Tactical Warfare Programs, the Office of the Secretary of Defense. Don Fredericksen is responsible for tactical warfare programs in the Department of Defense.

Maj. Gen. W.A. "Dutch" Shoffner is here, Assistant Deputy Chief of Staff for Operations and Plans, Department of the Army. General Shoffner is the senior Army officer responsible for developing future combat procedures integrating ground combat with close air support.

Maj. Gen. A.L. Logan of the Air Force, Director of Plans, Deputy Chief of Staff for Plans and Operations. General Logan is the senior Air Force spokesman for Air Force plans to modernize close air support.

Dr. Robert Moore, who is the Deputy Director for Systems and Technology of DARPA, the Defense Advanced Research Projects Agency, is also going to be with us this morning.

Dr. Moore has been looking at other promising ways to develop a new generation of close air support aircraft.

And Maj. Gen. Michael Sullivan of the Marine Corps, Commanding General, Second Marine Aircraft Wing, Cherry Point, NC, is also here.

We welcome all of you gentlemen. We were going to call on Mr. Fredericksen first, but I think we will start with General Shoffner in the absence, temporary absence, of Mr. Fredericksen.

General Shoffner, welcome.

Before you proceed, I will enter into the record the prepared statement of Senator Alan Dixon.

[The prepared statement of Senator Dixon follows:]

PREPARED STATEMENT OF SENATOR ALAN J. DIXON

Mr. Chairman, I am pleased to welcome this distinguished panel today to address the critical need of the United States Army for close air support for their combat forces. Mr. Don Fredericksen, Deputy Assistant Secretary of Defense for Tactical Warfare, Major General Dutch Shoffner, USA, Deputy Chief of Staff for Force Development, Major General Logan, USAF, Dr. Robert Moore, DARPA, and Brigadier General M.P. Sullivan, USMC, will be able to provide important insight into the best ways to meet the close air support requirement.

During consideration of last year's defense budget, this committee, under the able leadership of my colleague Senator Levin, worked to modernize our conventional forces. This hearing today is a continuation of our efforts to modernizing our forces through more efficient production of existing conventional systems and to stress the importance of commonality of systems within the services. At that time I raised the issue of the need to look into our Armed Forces commitment to close air support programs and the possibility of using one aircraft to satisfy the mission. I believe

that the AV-8B, which is the choice of Marine Corps, and the British military, for close air support, is an excellent, least cost option for the total United States close air support mission.

Senator Levin has pointed out, in his excellent report on the results of his European trip to observe the NATO conventional forces, the importance of reducing our dependence on fixed air bases. His recommendation on how to avoid this dependence, that increases our vulnerability to Soviet attacks, is to procure significant numbers of V/STOL aircraft such as the AV-8B. He further recommends that the Air Force consider the Harrier for dedicated close air support, so that we can reduce the unit cost of the procurement, and reduce risk to fixed air bases. I concur with this perceptive assessment of our distinguished chairman.

It is my understanding that the Air Force is considering the F-16 as the replacement for the A-10 aircraft. While the F-16 is an excellent aircraft well suited to its fighter mission, there is significant doubt that it can be effectively and economically modified to provide close air support. I expect that our witnesses today can provide information on the relative capabilities and costs of both the F-16 and AV-8B, and any other alternatives under consideration.

Whatever the final recommendations of this subcommittee or the Department of Defense and the services, it is critical that we move forward to meet the close air support requirement.

Currently there are no funds in the budget for a replacement for the A-10 aircraft, despite the recognition that the A-10 does not have the capability to meet the Army's requirement, especially for night attack. I want to see this mission elevated to a high priority within the defense budget. The defense of our ground forces is critical to meeting the conventional threat.

This hearing should lay the groundwork for a decision on the future of close air support. I welcome this opportunity to share my concerns with the members of this subcommittee and our defense panel.

Thank you Mr. Chairman.

STATEMENT OF MAJ. GEN. W.A. SHOFFNER, U.S. ARMY, ASSISTANT DEPUTY CHIEF OF STAFF FOR OPERATIONS AND PLANS (FORCE DEVELOPMENT AND INTEGRATION), DEPARTMENT OF THE ARMY

General SHOFFNER. Thank you, sir.

We have prepared some opening comments which are reasonably brief, that outline the nature of the requirement and then the way in which that requirement will be met. I will speak to the ground requirement for the Army, and then John Hopkins will talk to the ground requirement for the Marines.

Al Logan will talk about how the Air Force will meet close air support, and then Mike Sullivan will talk about the Marine close air support.

I will not attempt to summarize, sir, Mr. Fredericksen's opening comments. He will provide those for the record. We do in fact have the joint Close Air Support Mission Area Review Group formed, which he is chairing, to look at this requirement and look at the aircraft. It has a good, thorough scrub of the threat. Were Don Fredericksen here, he would lay that presentation out to you to identify the nature of the problem and the nature of the environment in which it must be accomplished.

When we finish, perhaps you may want to address questions to us on that.

I am pleased to outline the Army requirements for close air support on the air-land battlefield of the 1990s. We recognize that close air support is a difficult mission and a vital element of combat power that must be applied by the maneuver commander, who will have to fight and win against numerically superior enemy forces.

Army requirements for close air support can perhaps best be understood if I briefly review the nature of the battlefield and then describe the role of close air support as an element of combat power and how it will be employed. As long as the Soviets and their surrogates remain the principal threat, our major objective must be to defeat the Red Army.

The Soviet army commander has two problems: first, his offensive strategy demands that he concentrate five times the combat power of the defender's force; and second, the Soviet army commander is restricted by terrain from concentrating more than perhaps a fourth of his maneuver forces at any one time.

So his principal challenge is to generate and sustain the necessary combat power at the point of attack. To defeat him, our challenge is to deal effectively with the lead operational elements, those lead armies. There are two parts to this:

First, we must win the armor/anti-armor fight, where the forces close on each other and the tactical battle is joined, for that is where we determine winners and losers.

Second, we must deal simultaneously with his ability to generate and sustain combat power at the point of attack. Corps and division commanders fight against his follow-on forces. Close operations conducted by brigade and battalion task force commanders fix the Soviet, destroy his force, and thus deny him the breakthrough that he wants.

Our view of battle reflects the joint and combined nature of modern warfare. We emphasize fighting as a combined arms team. The combined arms approach to battle requires integration of all forms of weapons: infantry, armor, artillery, army aviation, and air power.

When we join the enemy in battle, we want to present him with a confusing, violent, simultaneous attack by many means. We create for him an incredibly complex and lethal problem that defies a single easy solution.

Close air support is a vital element of combined arms, the means to rapidly concentrate decisive combat power at the right time and place. It occurs within the lethal envelope of close combat operations.

Close air support must be responsive. It requires positive control and proper integration. We fight close air support as a part of the ground commander's combined arms team. When they develop their concept of operation for a fight, the ground maneuver commanders must know what close air support will be available, its responsiveness, and its capability.

Knowing what air support they can count on allows the ground commanders to plan for the integration of joint air and ground combat power. Close air support mission planning and execution is closely integrated with movement and fires of friendly ground forces, the timely intelligence, and the suppression of enemy air defense systems.

The level of detail required for successful execution of close air support requires a closely integrated, dedicated close air support planning system, with habitually associated fighter pilots and ground commanders. Dedicated tactical air liaison officers have the technical and tactical competence to understand the ground com-

mander's plan, know what aircraft and ordnance are available to support the fight, and are sufficiently experienced and knowledgeable to recommend the best employment, times, and targets for these close air support systems.

The tactical air liaison officers who are available at the brigade and task force are doing that today.

Fighting combined air and ground fires in close proximity to friendly ground forces imposes special air-ground interface requirements on the close air support system. Close integration and positive control must occur between the airborne platform, the forward air controller, the fire support officer, and the ground commander.

Tactical air control parties are habitually associated with the ground forces to make close air support work. How we plan to fight the air-land battle, together with the sum of our lessons learned in combat and in our training experience, projected forward in time, provide the basis for Army close air support requirements in the 1990s.

The Army's focus is on what the close air support must deliver, rather than on the platform from which it is delivered. Close air support must be responsive in day, night, and under weather. It must be survivable, capable of delivering munitions which can destroy all types of enemy targets, in contact or directly supporting forces in contact.

Close air support must be fully integrated into the ground commander's scheme of maneuver and have a dedicated forward air control organization. These requirements are more fully described in the jointly agreed to mission requirements package for close air support.

The Army cannot and does not focus exclusively on the higher end of the spectrum of conflict. Conflicts involving light forces present a somewhat different problem, lethal but less concentrated air defenses and a different target set and environment. Nonetheless, the fundamental challenge of close air support remains: responsive support within the ground commander's scheme of maneuver.

A short word on JAAT, the Joint Air Attack Team of close air support and Army helicopters. Attack helicopters and close air support are complementary means of rapidly concentrating decisive combat power for the ground commander, each contributing distinctive capabilities to the combined arms team.

Close air support delivers heavy payloads of various types of ordnance at high speed across a combat mission radius of more than 250 miles. Mission loads are tailored to meet the threat. Attack helicopters provide support as an integral part of Army forces at all echelons.

An effective way for a commander to rapidly shift and mass decisive combat power which has been developed through joint training is the Joint Air Attack Team. JAAT is a well practiced, fully proven means of employing close air support, attack helicopters, and artillery in a combined arms attack against a single enemy formation.

In fiscal year 1987 alone, more than 3,000 Air Force tac air sorties were flown in support of joint Army-Air Force training, to include JAAT.

In his April 3, 1958 special message to the Congress, President Eisenhower said that "separate ground, sea and air warfare is gone forever. If ever again we should be involved in war, we will fight it in all elements, with all services, as one single concentrated effort".

In closing, sir, I would point out that the Army fully supports ongoing Air Force efforts to modernize its tactical fighter force. We have worked closely with the Air Force and with OSD to determine specific requirements for a follow-on close air support aircraft.

We are in agreement on these requirements. The Army is confident that the Air Force in the air-land battle will provide the close air support to the maneuver commanders when and where it is needed.

Senator LEVIN. General Shoffner, thank you very much.

General Logan.

STATEMENT OF MAJ. GEN. A.L. LOGAN, U.S. AIR FORCE, DIRECTOR OF PLANS, DEPUTY CHIEF OF STAFF FOR PLANS AND OPERATIONS, DEPARTMENT OF THE AIR FORCE

General LOGAN. Thank you very much, sir.

I appreciate the opportunity to address this forum on behalf of the U.S. Air Force and put the issue of close air support into prespective.

First, let me assure you that the U.S. Air Force is firmly committed to supporting the Army and its operations. In the tactical air forces, our primary mission is to support the theater commander and the other services, whether shooting down enemy aircraft with bombs en route to friendly forces or providing firepower in close proximity to friendly troops, destroying enemy forces in battle in the immediate vicinity of our forces or providing fire support in close proximity to friendly forces.

Support of the Army is a fundamental Air Force mission. We are committed to this support organizationally, historically, and personally.

In examining the specific mission of close air support, we must look at the task required and the environment in which the task must be accomplished. The U.S. Air Force works very closely with the U.S. Army to understand the mission requirement for close air support as defined by the U.S. Army.

We strongly believe that articulation of the requirement is properly an Army function. They command the troops that must be supported.

Once the requirement is defined, we in the Air Force determine how best to meet it. The Army has done a superb job in laying out the task and the conditions under which it must be carried out. The battlefield of the 1990s as defined by the Army and envisioned by air-land battle doctrine poses a number of challenges that we are working hard to meet.

We expect a fluid, non-linear forward line of troops, with the major combatants ebbing and flowing with the battle. Success on this battlefield will require a constant application of combined arms against the enemy to force a change in their course of action and to achieve the objective of defeating their attacks.

Improved surveillance techniques will give near real time intelligence to allow us to attack enemy forces during close and deep operations. The geographical mixing of forces will require our aircraft to penetrate hostile air space in performing both the close air support and the battlefield air interdiction missions.

We must be able to perform combat operations continuously—day, night, and in adverse weather. We have a process to determine the best solution for meeting the needs of the Army in close air support. We are going through that process now and are reviewing numerous factors. As a minimum, the technical characteristics of the aircraft must include the following:

It must be responsive to the battlefield of the 1990s, with the flexibility to accomplish close air support and battlefield interdiction missions. This includes the ability to operate at night, under the weather, with high sortie rates.

It must be able to accurately locate and identify the target. It will need a high degree of lethality, including the ability to carry a wide array of ordnance and deliver it accurately.

It must be able to survive against the full spectrum of enemy air defenses.

In addition to the technical characteristics of the aircraft, we must be extremely cognizant of the fiscal constraints we are under and those we foresee in the future. The system must be compatible with the existing support structure, support systems, and operational concepts in support of the joint force commander.

My prepared statement further elaborates upon the theater nature of close air support, and I encourage you to peruse it.

We derive our information from a variety of sources, including historical studies, in-house studies and analysis, and contractor studies. After we receive these inputs, we will apply the seasoned judgment of combat commanders who have responsibilities for ensuring the successful execution of the mission in defense of our Nation. Only after this rigorous process are we prepared to recommend solutions to the Department of Defense and to the Congress.

In summary, sir, the Air Force is 100 percent committed to support of the U.S. Army. We have demonstrated this support in the past. We are supporting them today, and we will continue to support them in the future. The Army has outlined their requirements for close air support in the 1990s, and we in the Air Force will determine the best solution for meeting the Army's needs.

We believe the process is working, and we solicit your support as we continue to provide the defense this Nation deserves.

Thank you, sir.

[The prepared statement of General Logan follows:]

STATEMENT OF: MAJOR GENERAL ALBERT L. LOGAN
DIRECTOR OF PLANS
HEADQUARTERS, USAF

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE

I appreciate the opportunity to address this forum on behalf of the United States Air Force and to try to put the issue of where we are headed in close air support in perspective.

First, let me assure you that the US Air Force is firmly committed to supporting the Army and its operations. In the Tactical Air Forces, our goal in all of our primary missions is to support the theater commander and other services. Whether it's shooting down enemy airplanes laden with bombs headed for our friendly troops or destroying enemy forces deep in enemy territory before they can influence the battle in the immediate vicinity of our forces or providing supporting fires in close proximity to friendly forces -- support of the Army is a fundamental mission. We are committed to this level of support organizationally, historically, and personally.

In examining the mission of close air support we must look at the task to be accomplished and the environment in which it must be done. The USAF has worked very closely with the US Army to understand the mission requirement for close air support as defined by the Army. We strongly believe this articulation of the requirement is properly an Army function, because they command the troops that must be supported.

Once this requirement is defined, we in the Air Force must determine how best to meet it. Our colleagues in the Army have done a superb job in laying out the task to be done

and the conditions under which it must be carried out.

The battlefield of the 1990s, as defined by the Army, and as envisioned by AirLand Battle Doctrine poses a number of challenges that we are working hard to meet. We expect a fluid, non-linear forward line of troops with the major combatants ebbing and flowing with the battle. Success on this battlefield will require a constant application of combined arms against the enemy to force a change in their game plan and to achieve our objective of defeating their attacks. Improved surveillance techniques will give us near-real-time intelligence to allow us to attack enemy forces during close and deep operations. The geographical mixing of forces will require our aircraft to penetrate hostile airspace to perform both the close air support and battlefield air interdiction missions. We must perform cambat operations continuously -- day, night, and in adverse weather.

We have a process to determine the solution for meeting the needs of the Army for CAS. We are going through that process now and are looking at numerous factors. The technical characteristics of the aircraft must include the following:

- The aircraft must be responsive to the battlefield of the 1990s with the flexibility to accomplish the CAS and interdiction mission. This includes the ability to operate at night and under the weather with high sortie rates.

- It must be able to accurately locate and identify the target.

- It needs a high degree of lethality including the

ability to carry a wide array of ordnance and to deliver it accurately.

- It must be able to survive against the full spectrum of enemy air defenses.

In addition to the technical characteristics of the aircraft, we must be extremely cognizant of the fiscal constraints we are under and that we foresee in the future. The system must be compatible with existing force structure, support systems, and operational concepts in support of the Joint Force Commander.

Examining the current tactical force structure, the Air Force maintains 10 Tactical Fighter Wing equivalents (72 aircraft/wing) designated by their Designed Operational Capability (DOC) statements to CAS and BAI. Out of a total force of 38 fighter wings, 28 percent of the tactical force is a significant commitment to this mission area. In addition, all the multi-role assets -- another 50 percent of the force -- can be tasked to perform CAS if directed. By comparison, the Air Force maintains less than three fighter wing equivalents for deep interdiction and only seven wings are designated for air superiority! The bulk of the fighter force is essentially multi-role because we lack the ability to perform all the potential tactical air (TACAIR) missions simultaneously. More simply stated, there is not enough TACAIR to go around, thus we depend upon the flexibility of multi-role aircraft to focus airpower on missions as dictated by the circumstances of war.

As we look to the 1990s and beyond, the task of providing air support to surface operations must consider several

important factors. The high tempo, non-linear battlefield of the future does not permit simplistic views of the operational difficulty of performing CAS. Unlike Korea and Vietnam, the threat will be intense and lethal. There will be no surplus of airpower to channel toward less productive and/or high attrition missions. Therefore, we must answer one primary question: "Does CAS fundamentally contribute to victory in a manner not attainable by other weapon systems, missions, and/or strategies?" Assuming the answer is "yes" (addressed below), we must then consider two other vital questions: 1) "What is the threat CAS faces and can it be countered?" and 2) "What is the theater level operational concept (i.e., air and ground campaign) into which CAS must be integrated?"

The answer to these questions involves more than building single mission "Mudfighters" to attrite tanks, and conversely, encompasses more than having "some mission" to perform with multi-role aircraft if/when air superiority is attained. A capability to perform CAS is essential at both the tactical and operational levels of war. While a classic CAS target of engaging enemy armor can be critical to a supported battalion commander, CAS is even more important at the operational level. Like other TACAIR missions, CAS focuses combat power over time and space against theater objectives. Thus, CAS must be as responsive and flexible to the Joint Force Commander (JFC) as it is to the battalion commander. CAS should be massed against regiments and divisions (or selected combat support aspects of them), and not dissipated in a piecemeal fashion against small, fleeting, or noncritical target arrays. Only fixed wing aircraft can mass the required ordnance, over the necessary distances, in a timely manner to perform this theater CAS mission.

Because CAS is a necessary capability, can it survive the future air-to-air and surface-to-air threat to remain viable? Estimates show significant threat improvements regarding "G" capability, warhead lethality, guidance accuracy, ECCM, envelope expansion, and multi-target engagement potential. In addition, the small arms/AAA threat remains and the air-to-air threat has developed a crucial all-aspect, look-down shoot-down capability. To survive this environment, aircraft have to avoid hits rather than absorb hits. This requires speed and sustained turn performance coupled with stand-off multi-target engagement capability predicated on better avionics and target cueing. Additionally, the threat needs to be tempered with operational reality to avoid an erroneous high threat dilemma in which no aircraft, regardless of capabilities, could survive. The Central Region will not be intensely high threat across the entire battlefield every hour of the war. It will be high threat in many areas, but several combined factors including: movement of forces, degraded enemy air defense coordination, munitions expenditures, lower system operational rates and lower accuracy while on the move, chaos of war, and attrition due to lethal suppression and combat will eventually degrade the threat toward medium or low in many areas across the battlefield.

Close air support must be viewed from the perspective of joint warfighting, and must be fully integrated into the Joint Force Commander's operational campaign. From one view, CAS visibly "supports the Army," but on a higher level, both the Air Force and the Army support the objectives, missions, and strategies of the JFC. The Services are co-equal components responsible for executing his theater campaign. The JFC

synchronizes air and ground efforts, and focuses TACAIR support (CAS AI/BAI and Counter Air) to seize the initiative and disrupt the enemy's tempo of operations. The JFC accomplishes this by apportioning airpower among the various TACAIR missions. The Air Component Commander (ACC) in consultation with the Land Component Commander (LCC) develops the apportionment recommendation, but ultimately responds to the JFC's decisions by allocating assets. Thus the JFC determines the level of effort devoted to CAS, and he seldom (if ever) wears a blue uniform! Critics who believe the Air Force is going to "run off" and avoid the "dirty CAS mission" show a limited grasp of the realities of theater warfare.

CAS must be supported by and integrated with other TACAIR missions to execute the air war and support the land battle. Sustained CAS efforts against priority target arrays will certainly occur in close conjunction with AI/BAI and counter air defense suppression efforts. CAS must support the depths of the battle area and may involve significant penetration into enemy territory. Thus CAS is not tied to any "line" or "area" of the battlefield and results from the functions and procedures needed to project airpower in close proximity to friendly forces or from the detailed coordination requirements. Like CAS, BAI is not tied to any line on the battlefield. It results from the functions and procedures required to project airpower in support of surface operations and is geared to achieve a "near term effect" where the close proximity of friendly forces is not a factor. CAS and BAI support the surface battle both immediately and near term, but at the same time BAI is part of, and must be fully integrated with, the interdiction

campaign to achieve the combat objectives of delay, disruption, and destruction.

The probable AirLand Battle concept of operations, with the potential for close, deep, and rear TACAIR support to occur simultaneously, reveals the value of an aircraft capable of performing both CAS and AI/BAI in any area as the situation dictates. This is particularily important given current limited assets. In future wars, TACAIR aircraft performing CAS and BAI will intermix across the battlefield, the major distinction in function being dictated by the proximity of friendly forces, and therefore the different procedures used to execute the sortie -- not the place where the mission occurs. This fully recognizes that systems and procedures needed to integrate CAS in close proximity to friendly forces are unique, will not be sacrificed for BAI, and in fact will increase the success of both CAS and BAI due to enhanced flexibility and responsiveness. It also demands a control capability to coordinate and execute timely BAI, and to integrate CAS and BAI to achieve a synergy in support of theater objectives. This should be accomplished within the framework of "mission type" orders, making the air component responsible for planning and executing operational level missions, instead of "servicing targets" at the tactical level.

As we look at current Air Force and Army agreements on CAS, support of joint warfighting is clearly evident. The Army and Air Force Chiefs of Staff Joint Initiatives on Fixed Wing CAS, Follow-on CAS, Rear Area CAS, and on Manned Aircraft Systems acknowledge the current delineation of CAS roles and missions. These initiatives were followed by extensive

interchanges in drafting the Mission Requirements Package for follow-on CAS. Essentially, the Army defines the characteristics of, and its requirements for, AirLand Battle, and the Air Force is responsible for fielding a weapon system capable of meeting these requirements.

As we reflect upon the history of CAS and build upon our joint agreements to provide future warfighting capability, the Services should keep four constants in view. First, CAS has worldwide applicability. The requirements and capabilities desired for the mission vary with the spectrum of the threat from low to high intensity. While the Central Region is obviously the most demanding, it could be the least likely to occur. At the same time, CAS must be offensive as well as defensive across this threat spectrum to be operationally useful.

Second, CAS has historically proven to be a higher attrition mission during intense engagements and has always involved instances of fratricide -- both of friendly ground forces and of CAS aircraft. This stems from the chaos of war occurring in the battle area and the reality that mobile threat systems usually deploy to protect forces (not geography) hence, the more violent the battle, the denser the threat.

Third, CAS must be massed, lethal, continuous, and responsive in order to be effective. Conversely, at times, CAS is not suitable against all targets. This recognizes that CAS can fill organic firepower shortfalls, or synergistically contribute to Army fires to produce a total effect on the enemy that is both psychological and physical. However, not all scenarios lend themselves to CAS. Excessive firepower and

collateral casualties in a low intensity conflict can produce negative results. In high intensity conflict, the expected results against some targets may not offset the risk to the supported ground force or to the aircraft and pilot.

Lastly, CAS must be viewed as a total system that is not bound to a particular airframe. CAS warfighting capability consists of the training, C^3, logistics, and operational concept which places that weapon system on target. Recognition of the true interaction of these elements, and the environment in which they must function, places the characteristics and requirements of a CAS aircraft in perspective. The aircraft must be capable of surviving the threat, lethal enough to attack a broad range of targets, and flexible enough to perform both CAS and BAI on the future battlefield.

We derive this information from a variety of sources including: historical studies, in house studies and analysis, and contractor studies. After we receive these inputs, we must apply the seasoned judgement of combat commanders who have the responsibility for ensuring the successful defense of our nation. Only after we go through this rigorous process are we then prepared to recommend solutions to the Department of Defense and to the Congress.

In summary, the Air Force is one hundred percent committed to supporting the US Army. We have demonstrated this support in the past, we are supporting them today, and we will continue to support them in the future. The Army has outlined their requirements for CAS in the 1990s and we in the Air Force are now going through the process to determine the best solution to meeting the Army's needs. We believe the process is working and we solicit your support as we earnestly work to provide the defense this nation deserves.

Senator LEVIN. General Logan, thank you very much.
General Sullivan or General Hopkins you are next.

STATEMENT OF BRIG. GEN. JOHN I. HOPKINS, U.S. MARINE CORPS, DIRECTOR OF OPERATIONS, HEADQUARTERS, MARINE CORPS

General HOPKINS. Mr. Chairman, I welcome this opportunity to share with you my views on Marine Corps requirements for close air support. I am assigned to Headquarters Marine Corps, as the Director of Operations.

The Marine Corps presentation will be twofold, sir. As an infantry officer, I will speak to the conduct of close air support from the perspective of the ground combat element commander of the Marine Air-Ground Task Force or, more simply stated, from the outlook of a battalion, regimental, or division commander.

Brig. Gen. Mike Sullivan will follow me, providing his viewpoint as the Commanding General, Second Marine Air Wing, and his responsibilities for close air support.

As a backdrop, I would first like to begin by stating that the process for determining Marine Corps warfighting requirements is based on the development and analysis of operational concepts. These requirements then provide the justification for changes to doctrine, training, force structure, and material.

Having said that, the Marine Corps requirements for close air support spring from the operational concept of the employment of Marine Air-Ground Task Forces, commonly referred to as MAGTFs. The ground combat element is a combined arms team, characterized by the full range of direct fire, indirect fire, tank, and antitank assets. But the bulk of the fire support its provided by artillery, naval gunfire, and close air support.

Our assessment has shown that, of all the fire support assets available, close air support is the most flexible, is responsive under all conditions of range, array of targets, and weather, and provides the element of depth to the battlefield that is not obtainable in any other way.

Success or failure of the MAGTF is dependent upon the efforts of our ground forces. Only marines on the ground can take an objective or can hold terrain against the enemy. The role of a ground combat commander therefore is to employ all the available fire support assets to maintain the momentum at the point of main effort or to take away the initiative from the enemy when we defend. A commander accomplishes both of these operational imperatives by maneuver and the maximum utilization of his supporting arms.

Close air support is a unique weapon on a battlefield where opportunities are fleeting, and aviation provides an advantage of significant consequence. A commander's concept of close air support is simple. Speed on the battlefield is essential to success.

That is to say, when close air support is rapidly available, our probability of success increases dramatically. In my opinion, aviation capabilities give you geometric vice arithmetic results in battle.

In the Marine Corps, we define responsive close air support as 20 minutes from the initiation of a close air support request until bombs are on the target. The Marine Corps has long recognized the requirement to position attack air assets very near the forward edge of the battle area or the FEBA.

Forward arming and refueling points can be established directly in back of our forward deployed troops to further expedite the turn-around times of VSTOL and attack helicopters, and this ensures continuation of the attack or support to the defense and the repeated availability of attack capabilities.

When close air support is employed, it will be under positive control of ground forces at all times, even under adverse weather conditions. The Marine Corps has perfected control techniques for close air support over the years, whether it be in peace or conflict.

We train as we fight. That means continually honing our skills in close air support procedures, with live ordnance every chance we get.

Our fire support plans integrate ground forces, artillery, armor, and aviation, and it provides a lethal synergistic effect on the battlefield.

I also believe that one of the capabilities that the Marine Corps possesses that is really unique is the ability to simultaneously use air, naval gunfire, and artillery, because of our comprehensive training in the procedures necessary for shifting fires and other fire control techniques.

A number of tests to determine whether close air support can be conducted in a high tech battlefield have given compelling evidence that it can. As the battlefield develops, we will use close air support to exploit our successes in the attack or to seal off penetrations when we defend.

In summary, I would like to make just two points: close air support is an integral part of the Marine Corps doctrine; and the ground combat element commander considers it absolutely essential in planning for combat.

Thank you, sir.

STATEMENT OF MAJ. GEN. MICHAEL SULLIVAN, U.S. MARINE CORPS, COMMANDING GENERAL, SECOND MARINE AIRLIFT WING

General SULLIVAN. Good morning, sir. It is a pleasure to be here and I am looking forward to answering any questions you may have on Marine close air support.

I have a statement to enter for the record. I think everybody has a copy of it. Plus I have a handout on VSTOL operational flexibility, which I used at a conference in California on power lift. It explains a lot of the things which are not too technical.

I would like to say a few words this morning about Marine aviation and what we do in close air support. The primary reason that the Marine Corps has airplanes is to support that infantry commander on the ground.

One of those functions—we have six—is offensive air support. Close air support is one of several tasks within the offensive air support functions. Close air support is the bread and butter for

that guy on the ground. He can be ensured that he is going to get that because those aircraft are dedicated; they are Marine aircraft.

There are four ingredients that we feel are important to successfully conduct close air support: first, people; second, tactical training; third, procedures; and last, aircraft.

On the people business, we all start out together. In fact, John and I grew up together in the Marine Corps, and we started out in basic school before we had ever seen an airplane, and we learned the same requirements. We learned the infantry requirements.

From basic school we went our separate ways. We both became forward air controllers. Forward air controllers are Marine aviators who coordinate the close air support. We send a tour doing this. We supported each other as battalion commanders and squadron commanders; and as regimental commanders and group commanders. In fact, I was the assistant wing commander and he was the assistant division commander. All through our careers, we knew each other and knew what each other's requirements were.

Our air-ground tactical training is done several times a year at MCAGCC, 29 Palms, California. We do live fire exercises where we drop live bombs in support of our ground troops, real close air support. We have division, brigade, and Marine expeditionary unit level exercises on a regularly scheduled basis throughout the year. Our aircraft provide daily close air support training.

I have over 400 aircraft in my wing. Over half of those are tactical jets. All of those tactical jets provide some form of close air support or support for it.

The procedures we use are time tested, starting out in its infancy in Nicaragua until today with the most modern aircraft, communications, and armaments. In fact, both the Marine Corps and the Air Force use very much the same procedures.

Last, we have our aircraft. The mainstay in close air support is the AV-8B Harrier because it has the capability to operate off of roads, grass strips, and amphibious ships. It does not require an 8,000 foot strip or an aircraft carrier. It is capable of flying fantastic ranges with full payloads in all weather conditions.

Our next airplane, F/A-18, is both a fighter and a close air support aircraft, but it requires a conventional runway or, as we call it, an M-21 morest gear, where we put a wire down on the field or on the road and where you can trap this airplane.

The A-6E, our all-weather attack aircraft, can provide close air support under all weather conditions or night. Last, we have our EA-6B, which we feel is the world's finest EW platform for jamming. We also have helicopters, Cobras and our Hueys that provide close-in fire support.

Most importantly, the bottom line, and I am prepared to answer any questions, is that we feel that our close air support is responsive and very timely, 20 minutes or less, which we feel is essential. It is lethal, it is flexible, and most importantly it is dedicated for our Marines, and it is VSTOL.

We feel strongly about the necessity of that capability today on the battlefield. You have to have more than one club in your bag, and VSTOL is that capability and it is the wave of the future.

Thank you, sir.

[The prepared statement of General Sullivan follows:]

STATEMENT OF

BRIGADIER GENERAL M. P. SULLIVAN

UNITED STATES MARINE CORPS

COMMANDING GENERAL, SECOND MARINE AIRCRAFT WING

Mr. Chairman, distinguished members of the panel:

I welcome this opportunity to share with you my views on Marine Corps Close Air Support. "The primary mission of the Marine Corps Aviation is to support the Marine infantryman on the ground." The Marine Corps not only publishes this as doctrine but structures its organizations to ensure that it works--aviation and ground forces have a common commander in order to provide the most responsive close-air support.

Marine Corps combat organizations are configured to deploy and fight as a Marine Air-Ground Task Force (MAGTF). The size and equipment of the MAGTF varies dependent upon the specific threat and contingency. Each MAGTF has four elements: a command element (CE); a ground combat element (GCE); an aviation combat element (ACE); and a combat service support element (CSSE). There are three generic sizes of MAGTFs which are: the Marine Expeditionary Force (MEF); the Marine Expeditionary Brigade (MEB) and the Marine Expeditionary Unit (MEU). For purposes of comparison, the MEF is organized around a division and wing; the MEB, a regiment and group; and the MEU, a battalion and composite squadron.

As an expeditionary force, the MAGTF is designed to be light enough to get to the fight, yet heavy enough to sustain itself and win. Our infantry relies heavily on the use of a combination

of supporting arms, such as artillery, naval gunfire and aviation to defeat an enemy in battle. This fact, coupled with the inherent capability of aircraft to attack targets which other supporting arms cannot engage because of range/accuracy requirements or target defilade, defines the vital role of close air support to Marine forces. The GCE commander measures the effectiveness of this supporting arm very simply: "Was it responsive and was the target killed in a timely manner?" We believe that our aircraft must put bombs on target within twenty minutes of a request for support. Failure to meet this goal will likely cost Marine lives and prolong the battle.

JCS Pub 1 defines close-air support as "Air action against hostile targets which are in close proximity to friendly forces and which require detailed integration of each air mission with the fire and movement of those forces." The Marine Corps' commitment to this mission is evident throughout our command and control structure. Close-air support sorties are generated through tactical air requests (TARs) by forward air controllers (FACs) who are naval aviators working within Marine infantry battalions of the GCE. The TARs are processed through the battalion and regimental fire support coordination centers (FSCCs), and through the ACE's direct air support center (DASC) for assignment to the ACE units. The terminal control of close-air support aircraft is the responsibility and prerogative of the GCE.

The Marine Air Command and Control System (MACCS) integrates all aircraft and missile activities into a single, effective, coordinated system for the MAGTF commander. This system assists in processing requests, coordinating airspace use, and coordinating the employment of aviation assets to support the MAGTF concept of operations.

The elements of the MACCS are: Tactical Air Command Center (TACC), Tactical Air Operations Center (TAOC), Direct Air Support Center (DASC), Air Support Radar Team (ASRT), and Tactical Air Control Party (TACP). The TACC performs the essential command functions of all tactical air operations and is the senior air command and control agency. It provides the means to coordinate Marine aviation with Naval air assets for amphibious operations as well as with other Forces in joint or combined operations. The TAOC provides control for enroute air traffic and air defense operations including the control of both interceptors and surface-to-air missiles.

The DASC is normally collocated with the GCE FSCC to ensure the coordination of close-air support with the other supporting arms. The Air Support Radar Team (ASRT), attached to the GCE maneuver elements, provides the necessary radar control for all-weather close-air support.

Tactical Air Control Parties (TACPs) are the most important link in the command and control structure. TACPs are organic to the Marine division with one assigned to each division staff, regiment, and battalion. The TACP provides the ground commander with aviation officers--and their communicators--to advise and provide for integrated air support. The forward air control (FAC) parties--two per battalion are an integral part of the battalion TACP, and deploy with the forward companies. The TAC/FAC parties are staffed by qualified aviators who report directly to the ground commander.

The Marine Corps categorizes CAS missions in two types: preplanned and immediate. A preplanned mission is an air strike

which is anticipated sufficiently in advance to permit detailed mission coordination and planning. Preplanned missions are further categorized as either scheduled or on-call missions.

A preplanned scheduled mission assumes that all elements of information are available for preflight planning. Target location, time on target, type of weapons, and delivery tactics are predetermined and the flight requires only minimum airborne communications.

The term On-call implies that some planning data is available early. Ordnance may be loaded, general target location briefed, and the terminal controller identified. These missions are then executed (launched) at the request of the supported unit. Pilots may not have all mission essential information prior to takeoff.

Immediate missions are executed in response to requests by the ground combat element (GCE) to strike targets of opportunity. The tactical situation may require that aircraft be diverted from a preplanned mission to an immediate mission. Mission coordination is often accomplished while the CAS flight is enroute, with the attack aircraft being briefed by the enroute or terminal controller. To ensure responsiveness of our aircraft to immediate missions, we must shorten the lines of communication through which a tactical air request must be processed and shorten the distance over which the aircraft must fly to reach the target.

Prerequisites for Effective Close-Air Support

We believe that some prerequisites are essential for effective CAS. It should be emphasized that CAS is still possible without

all of these conditions being met, but effectiveness may be impaired.

a. **Air Superiority.** Local air superiority will always be a requirement for executing close air support missions. We do not demand or predict total air supremacy throughout the area of operations, but local air superiority is required within the target area during the conduct of the CAS mission.

b. **Suppression of Enemy Air Defense.** Aircraft conducting close air support may well be exposed to ground fire. Therefore, specific action must be taken to neutralize or suppress the enemy air defense, at least locally, prior to or during a CAS mission.

c. **Target Acquisition.** Ground commanders must provide FACs with a responsive and effective means of identifying the target for the pilot. Methods available include indirect and direct fire weapons firing smoke, white phosphorus or illumination rounds. Laser designator and radar beacons are organic to FAC teams and are used when possible. Verbal orientation may be sufficient for preplanned missions and when other means of target marking are not practical. Acquiring the target is essential in close-air support. The pilot must know where it is in relation to friendly troops. Today's sophisticated, highly accurate weapons and target acquisition systems significantly improve the pilot's target acquisition capability.

Any military operation must be preceeded by an analysis of the threat. The level of anti-air threat in the target area will determine the tactics that will be employed during the execution of a CAS mission. On one hand, an enemy force that is not protected by air defense would allow a choice of altitudes for ingress to the target weapons delivery. Moreover, aircraft could

make multiple runs to optimize the probability of target kill. On the other hand, an enemy may be protected by a sophisticated anti-air umbrella which has only been neutralized locally. In this case, an aircraft executing CAS missions will necessarily employ low altitudes, high speed, terrain masking, and single ordnance delivery runs to minimize exposure to the threat systems. Skillful delivery of sophisticated systems is required for reasonable probability of success at an acceptable risk.

Our operational planning includes the establishment of a matrix of identifiable checkpoints throughout the area of operations. This network of checkpoints is published in all MAGTF operations orders and is available to FACs, pilot, and the command and control system. The matrix provides an easy method to define routing for aircraft enroute to and from the target area. Route selection for any specific mission is made to minimize the exposure to any threat, favor effective communications, and to complement the tactical situation on the ground.

Doctrine which has been standardized within DOD allows the terminal controller to communicate to the pilot, by burst transmission in an abbreviated form, the elements of information that are essential to execute a close-air support mission. The nine basic elements are:

1. An Initial Point (IP) from which to begin the attack. This comes from the published matrix of checkpoints.
2. The heading from the IP to the target.
3. Distance in nautical miles from the IP to the target.
4. The target elevation in feet.
5. A concise target description.
6. Target location by grid coordinates.

7. Type of target marking devise.

8. Location of friendly.

9. Routing for aircraft egress from the target. This is also expressed through the use of published checkpoints.

After years of experience, the CAS brief has been standardized. Pilots, FACs, the Ground Combat Element, and the command and control structure have all been trained to identify those essential elements and to use the brief even during communications jamming by the enemy.

Delivering close-air support that is reliable, accurate, and responsive is the responsibility of the ACE commander. To do this he must have aircraft that are able to sustain high sortie rates with minimum maintenance. Aircraft must be able to operate from a wide variety of locations. Amphibious ships, roadways or small civilian airfields will be available even when large airfields with 10,000 feet of concrete runway may not. The most efficient method of providing immediate CAS is to loiter the aircraft on the ground close to the action. The only alternative is to loiter them airborne burning fuel, but this generates a greater force level requirement to realize an equivalent response capability.

Our close-air support must have navigation systems installed to aid the pilot in orienting himself on the battlefield and finding the target. On board mission computers help to reduce the pilot workload by providing instantaneous ordnance delivery solutions. Multi-frequency sensor radios, laser designators and laser spot trackers are examples of the modern equipment which enhance our ability to execute CAS missions.

The solid state radios in use by the GCE today are significantly better then those we used in the past. Not only is secure communication possible, but successful communication in the presence of jamming is now attainable. As I indicated earlier, FAC teams have the RABFAC beacon which can be used to assist in delivery of air munitions in all weather conditions. The GCE also employs the Multiple Universal Laser Engagement (MULE) system to designate targets. Laser designation not only facilitates the delivery of specialized laser guided weapons, but also provides the basis for aircraft mission computer solutions to precisely deliver conventional weapons.

In summary, the Fleet Marine Force is organized, trained and equipped for combat as required in its role as the nation's expeditionary force in readiness. Aviation is a critical element in our organization for combat. To facilitate its combat effectiveness, not only are all Marines with aviation peculiar skills taught the same basic warfighting skills as all other Marines, but also designated aviators are assigned to the command, logistic and ground combat elements to ensure close and continuous coordination. We practice the way we intend to fight...putting bombs on target, on time.

Senator LEVIN. General, thank you.

AIR FORCE CLOSE AIR SUPPORT

General Shoffner, let me start with you. Let us go back to basics. Why do we need Air Force close air support anyway? Why not just rely on helicopters?

General SHOFFNER. Well, that is a good question. I can give you my perspective of that question, sir. The primary advantage within the world of constrained forces in which we are working is to give the commander the ability to rapidly shift his resources and concentrate from one fight to another.

The legs on the close air support enable the commander—and now we are talking about the operational level commander above the corps—to take a given set of assets and rapidly shift it from one part of the battlefield to the other in a mature theater. In my view, that is an important advantage to have.

Attack helicopters are fitted where they are habitually associated and integrated within the ground commander's scheme of maneuver. The corresponding piece for close air support is to have interface there also. That interface with close air support is the tactical air liaison officers, the tactical air control parties that are embedded in the ground organization.

I guess if you had an unlimited amount of assets, you would come up with different solutions but as long as we stay constrained, sir, I think it affords an opportunity to rapidly shift and concentrate combat power from one part of the battlefield to the other.

Senator LEVIN. General Sullivan just said that it is their requirement in the Marines that the aircraft put bombs on target within 20 minutes of a request for air support. And in his prepared statement, he made this follow-on comment, that failure to meet that goal would likely cost marines' lives and prolong the battle.

Does the Army have a stated time requirement for the delivery of close air support?

General SHOFFNER. Sir, we do not have a stated time requirement that I am familiar with that specifies a specific standard. We do in fact require that it be integrated with the ground commander's fight. I can tell you what our practice is at the national training center on the live fire ranges.

Senator LEVIN. What is it?

General SHOFFNER. The 20 minutes which was described by the Marines is typically the kind of responses, that or less, within which you want to bring the air into the effect on the ground.

Senator LEVIN. That is what you want to do. What is the average in fact?

General SHOFFNER. Sir, I could go get some data for you. I will give you my experience. Typically, you bring the air in and we try to bring it in so that you can hold it until the time is about right. That time will get very short, 5 minutes. Typically, I see some 5 minute response of getting the air in, given that you have done the planning for that.

TRAINING EXERCISES IN EUROPE

Senator LEVIN. What is the experience in the training exercises in Europe? They are probably a little more realistic than California.

General SHOFFNER. The live fire at NTC is fairly realistic because of the need to integrate all of the fires together with the forces.

Senator LEVIN. In terms of the closeness of the air base, it may not be realistic. What is the experience in Europe, during our training exercises for the average length of time it takes for bombs to be laid on the target?

General SHOFFNER. For planned, the close air support missions that have been integrated, they would be similar, sir, 15 to 20 minutes to the time that you get it into the fight.

Senator LEVIN. How about for the unplanned?

General SHOFFNER. Well, there are two forms of that we could see. First, is what we would call an immediate request, which says

here is an unplanned requirement which is an urgent requirement that I need help for, and if there is air anywhere that is readily available, it will be diverted.

Those times will vary anywhere from the short time to a longer time. The process—and I think you are familiar with the way in which we have designed the control apparatus—is essentially the same for both, given that there is some air available somewhere in the system. Within the Army group or within the numbered Air Force, the likelihood that you will be able to get an immediate divert is fairly high, given that you are in the process of generating sorties.

UNPLANNED CLOSE AIR SUPPORT

Senator LEVIN. Do you have statistics on the average length of time it takes for the unplanned close air support?

General SHOFFNER. I do not. Al, do you?

General LOGAN. Sir, I might be able to expand just a little bit. Our technique in central Europe, for instance, is that from various air bases we will plan launches of aircraft to occur with a variety of ordnance about every 10 minutes. These aircraft will then be vectored to a holding point or a handoff point.

At any time from launch to that holding point or from there en route to contact with the forward air controller, these aircraft can be diverted. So the length of time would be dependent upon the scenario.

But I would tell you that 5 to 10 minutes is commonplace, and in some cases it might be 2 minutes, depending on the situation and where the emergency request for close air might originate.

Senator LEVIN. General Shoffner, you mentioned there were two different kinds of unplanned close air support. What was the second kind?

General SHOFFNER. Well, the one would be an immediate. You put up an immediate request, and if air is available, as General Logan described, it will be diverted to you. If not, then you go back into the normal requirement and you would get some of the next generated air.

Senator LEVIN. And do we know how long that would take on average?

General SHOFFNER. Well, I think we can give you estimates of what that would be.

Senator LEVIN. What would they be?

General SHOFFNER. I do not think there is a simple answer to that, sir. It is a question of what you are in the process of generating and what force is coming off the air bases, where you are and how rapidly it can be vectored in there for you.

General LOGAN. Sir, could I try to broaden the answer on preplanned and immediate. A preplanned is a type target that might be selected in the battle plan for the following day or 2 days down the road. This would be a target the pilot went to the airplane with at Hahn Air Force Base in central Germany.

As he taxies out, if an immediate close air support request is approved through the system then he diverts right there. And again, an immediate would be served with 5 to 10 to 15 minutes,

probably 5, by en route fighters going to what had been a preplanned target.

So there is a little bit of confusion on the terminology. Preplanned is something that is ordered, structured, and laid out. The immediate would normally be a divert, and the response time would be 5 minutes, 10 minutes, depending on the length of time from the field to the holding point and from the holding point to the target area.

So I would stick to 5 or 10 minutes, sir, as the answer.

Senator LEVIN. Thank you, General.

Senator Quayle.

Senator QUAYLE. Thank you, Mr. Chairman.

Let me try to get into some basic policy questions, so I have a good understanding of what the Congress is going to try to resolve during the budget authorization. Perhaps you did it in your opening statements. I did not get to hear it all. I will try to read it in my spare time.

CLOSE AIR POLICY OPTIONS

But could someone lay out the policy options and the choices that we are going to have when we look at the issue of close air support?

General LOGAN. Sir, I believe the question is a follow-on for the mid-1990s for a vehicle to provide close air support by the U.S. Air Force to the U.S. Army. In an effort to meet that requirement, we have worked with the Army and a mission requirements package has been put together which articulates the battlefield of the 1990s.

It describes the requirement. It describes the environment in which close air support will need to be performed in the 1990s.

From that document, the Air Force will then make recommendations as to the vehicle that should fill those needs. We have ongoing a study called CASMARG (Close Air Support Mission Area Russian Group). Various contractors have been tasked to look at the requirements and make recommendations as to the characteristics of a paper airplane that might meet our close air support requirements. There are six different firms looking at that.

From the results, we will then apply judgment of commanders in the field, we will also consider our force structure, and make recommendations to the DOD and to Congress about what the follow-on vehicle should be.

Now, back in 1985 the Air Force attempted to put money against a new close air support aircraft. This was disapproved and we slid it 1 year. In 1986, we looked at the A–16, a derivative of an in-production fighter that would have missionized air to ground avionics and be designated as the follow-on close air support aircraft. We also proposed a modernization effort on the A–7, an aircraft that is already in the field. It would not be a replacement vehicle, rather a modernization of the existing A–7.

Again, this was delayed until we get through with the CASMARG study, which will be in the spring, with a decision by the fall as to what the Air Force recommendation will be.

Senator QUAYLE. Basically, the close air support is an Air Force mission that will be fulfilled. You are looking at the mid-1990s as a follow-on to the aircraft that you have?

General LOGAN. It is a fundamental Air Force mission to support the requirement articulated by the U.S. Army.

Senator QUAYLE. In the meantime, before we get there, what policy choices and procurement choices will the Congress have?

General LOGAN. There are no questions. We have an existing force structure that does the job. We have the A–10, we have the A–7, and we have what we call the swing force, which is some 40 to 50 percent of our tactical fighter resources that have the capability to perform close air support. It is not designated as their primary mission, as the A–10. The A–7 is designated for close air support and BAI.

What we are talking now is the next generation to continue to fulfill that requirement. So the next question before you, the Congress, I believe will be what is the next close air support vehicle.

CASMARG STUDY

Senator QUAYLE. That will come in this CASMARG study?

General LOGAN. Yes, sir.

Senator QUAYLE. And when will that be finished?

General LOGAN. It will be finished, I believe, late this month, early next. And we will review it, and by October we will be making a recommendation to the DOD for the follow-on close air support vehicle.

Senator QUAYLE. You will be making a formal recommendation and that will be what aircraft you want to have in the mid-1990s?

General LOGAN. Designated for close air support, yes, sir.

Senator QUAYLE. When you look at the close air support issue, are you looking at any kind of mix you might have with standoff weapons?

General LOGAN. Yes, sir.

Senator QUAYLE. Like what?

General LOGAN. In my prepared statement, I lay out some of the characteristics that the airplane should possess. One of those is a wide array of ordnance-carrying capability, sufficient range, payload, and endurance to perform the mission, avionics to allow it to do the mission constantly, day, night, under the weather, and the capability to generate high sortie rate.

And so all those things combined will make the demands for the vehicle quite strenuous.

STANDOFF CAPABILITY

Senator QUAYLE. What about the actual standoff capability and being able to deliver weapons from, say, 100 kilometers or 200 kilometers or 300 kilometers out?

General LOGAN. When you talk close air support, you have one requirement for standoff which is not quite that severe. As you begin to move into BAI and the air interdiction mission, where you would penetrate hostile air space, then the longer ranges on standoff become more important. But on close air support, I would not think that you would need in the 100 kilometer range for standoff.

But indeed you would need some.

Senator QUAYLE. What kind of range?

General LOGAN. That would be dependent on the threat, the munitions development and what is under development and available at the time.

Senator QUAYLE. But if you can fulfill a mission from not getting involved as close as possible, would that not be attractive as far as having that mix? I mean, the close air support in getting right on the target and getting right in there close, your vulnerability is increased. And if in fact you can fulfill and get those targets by utilizing the standoff capability, would that not be advantageous?

General LOGAN. Yes, sir, there is no question that it would be advantageous. We are only talking about how far it might be required for close air support.

As you look into battlefield interdiction and deep interdiction, then the requirement might be different. I cannot put a specific number of kilometers for close air support. I would say 100 is enough, because you are in friendly territory. There would be less demand to want to fire beyond 100 kilometers. It would also put a pretty heavy demand on the terminal phase accuracy when ordnance is coming down in close proximity to friendly troops.

Senator QUAYLE. My time is up. Let me make a suggestion that I hope in your report you might look at this compatibility of the standoff capability in fulfilling mission requirements by having some of the standoff capability, instead of total reliance on some of these things in the close air support, because if in fact you get additional range and you get accuracy, particularly on some of the cruise missile capability, that knock out fixed targets, knock out things that you may want to hit otherwise, it could prove to be quite valuable.

And I think there is an interrelationship there. At times we forget because we just focus on one little mission and we say close air support and say, well, that is just going to take us into a very limited area, and we do not look at the bigger picture.

And I hope that we might do that.

General LOGAN. I do not mean to mislead you. Do not let me give you the impression that we are not doing that and that the aircraft would not have that capability. The airplane would have the capability to fire the full array of ordnance that is available to it.

Senator QUAYLE. I wonder if I might ask General Shoffner one question.

Senator LEVIN. Sure.

Senator Thurmond, is that all right?

Senator THURMOND. Yes.

LHX HELICOPTER

Senator QUAYLE. You said in answer to Senator Levin in close air support that flexibility and speed were very, very important. I wonder how the LHX, particularly the 170 knot conventional helicopter, fits into that requirement of flexibility and speed.

General SHOFFNER. Good. What a great opportunity to answer that question for you.

Senator QUAYLE. That is why I asked it. I knew you were prepared. I wanted to give you one right down the center. I can see the smile on your face, and Senator Levin is going to be ready to catch it right over here.

Senator LEVIN. You better not blow this one, I will tell you.

Senator QUAYLE. I mean, this is your opportunity. We are going to define flexibility and speed at 170 knots.

General SHOFFNER. Sir, you may just want to stipulate then, if it is all that agreeable.

The role for the LHX is quite different than the role for the close air support, as we would see. And the performance of the missions——

Senator QUAYLE. Oh, it is not close air support, LHX?

General SHOFFNER. The tasks that it will be required to do on the battlefield are quite different than the tasks that close air support is designed for. Close air support will be optimized to attack a battlefield target which will require a high volume of ordnance and that target will not be known very much in advance. That is why the responsiveness is critical—as is the need to bring in a fairly heavy volume of ordnance to deal with that target.

Key to setting that battlefield up so that close air support can get in to fight is an LHX that is doing the armed reconnaissance function. The LHX can identify where that target is on the battlefield, identify where the friendlies are, describe the situation—we call that developing the situation—so that we have the friendlies fixed, the enemies fixed, and we know where the other elements of the team are. The person who would be flying on that LHX we would call an air battle captain. A very key role that he would play is putting in close air support and artillery and attack helicopters.

So the role of the LHX, to be able to move about on the battlefield, to extend the commander's eyes so that we can see where we are, where the enemy is, and move about in that environment, is the key role that the LHX will play for us. That is the armed reconnaissance role.

We will also configure some of the LHXs so that they can be outfitted for air-to-air combat to protect that force from other helicopters that are trying to attack which is quite different than the fast mover air-to-air piece. We will have some LHXs that can be tailored for attack missions. They will not be quite as heavy as we would have for an AH–64 or a close air support, but for light forces may be an adequate level of attack to deal with the threat that they fight.

Senator LEVIN. Senator Thurmond.

Senator THURMOND. Thank you very much.

We are glad to have you gentlemen with us.

B–52

General Logan, General Chain advocates the use of the G model B–52s in a conventional role. What are your thoughts on this?

General LOGAN. Yes, sir, I believe that is a very useful role, properly applied, of an extreme amount of firepower. The B–52 can be decisive. Whether it might be used as a close air support additive vehicle or whether it would be an interdiction or perhaps even in a

conventional strategic area would depend on the scenario and the battle situation.

But clearly the airplane is impressive in a conventional role.

Senator THURMOND. General Shoffner, in your statement I believe you point out that the Soviets are our principal adversary and defeating the Red Army our primary mission. My concern is that the majority of our systems are not capable of operating around the clock and in adverse weather.

OPERATING CLOSE AIR SUPPORT ASSETS

What percentage of time throughout the year in Europe is either night or adverse weather, and what percentage of our close air support assets can operate in this environment? I would like your best estimate, and if you care to answer further for the record feel free to do so.

General SHOFFNER. Thank you, sir. That is a very relevant question.

The night question I guess is easier for us to answer. The facts are known there on that, except I just note in the northern latitudes the nights are fairly short, days are fairly long during parts of the year.

We have studied the weather conditions extensively and I can provide for you, sir, and I would prefer to provide a detailed statement of what those weather conditions are, because there are specific definitions of the ceiling and visibility.

Let me tell you that there are many mornings where the fog does not lift until it is burned off late in the day. Those are seasonal variations. There is a fairly good portion of that time, and I will give you some rough approximations. During parts of the year you can't see well until 10 o'clock in the morning until the fog burns off or the ground haze burns off in certain parts. So being able to operate under those adverse weather conditions in my view is an important part if you are going to fight the Soviet in his central European scenario.

The business on night I would tell you is an area where we have made a major investment within the Army. It is an area where we have an asymmetric advantage over the Soviets, and it is an area where we would probably choose to fight, given the opportunity.

And I think the work that the Air Force has done on LANTIRN, their night capability for close air support, to enable them to join us in that fight is an important piece. What portion of the time would we fight at night? I do not know that I could give you a single answer. But if I could choose the terms to fight and I have the advantage over the enemy, I would prefer to fight where I have the best advantage and night is one of those conditions. So I would expect to see fairly extensive night operations, given the opportunity.

THE EFFECTS OF WEATHER ON THE AVAILABILITY OF CLOSE AIR SUPPORT

1. Purpose: This study was conducted to indicate the percentage of time CAS would be unavailable due to adverse weather during conflict in Central Europe.

2. Summary: Adverse weather conditions (ceiling and visibility) present significant limitations on the responsiveness and effectiveness of CAS for U.S. forces in Central Europe. There is no current or near-term available "all weather CAS" capability. Weather conditions vary by season and region, and can preclude the employment of CAS in the close battle area for up to 35 percent of the time during the winter season, 20 percent in autumn, 10 percent in spring,and 15 percent in summer. Early morning to mid-afternoon hours are affected most; conditions improve in late afternoon. Weather conditions during take-off are not as a significant factor in employing CAS as weather conditions in the battle area. Unavailability is less than 10 percent because of weather at the airfield (icing and wind limitations were not factored).

3. Assumptions and Methodology:

a. Climate zones and seasons are assumed based on similarity of weather conditions.

- o Rhine Valley = Location of most USAF bases (take-off weather).
- o European Highlands= CENTAG (target area/and enroute weather).
- o European Lowlands = NORTHAG (target area/and enroute weather).

Seasons:
Winter - Nov through Feb
Spring - Mar through May
Summer - June through Aug
Autumn - Sept and Oct

b. Current USAF ground attack aircraft, depending on avionics and mechanical design, have different weather capability for departure from runways and for delivery of munitions in the target area. In addition, target seekers and target designators on the munitions, in the aircraft, and on the ground can be negatively affected by weather, particularly those that require constant target lock-on prior to or during release of ordnance. For this study, weather data (GEOSIM statistics were provided by the Atmospheric Science Lab at White Sands) was applied against known weather critieria for the A-10 and F-16. The A-10 and F-16 are the current and most predominant CAS and Battlefield Air Interdiction (BAI) systems in Europe.

c. Weather criteria chosen were ceiling [cloud height above ground level with 4/8 cloud coverage or more (broken/ overcast condition)] and visibility (unaided sight degraded due to smoke, haze, mist). Factors of icing and wind, beyond limits of the aircraft, were not considered. These weather criteria were applied for take-off and delivery of mumitions in the target area throughout a 24 hour day.

The Army is training to fight at night and in all weather. The A-10 and F-16 curently are day only ground attack fighters for high threat conditions (flares are used at night in low threat). As navigation and targeting avionics are fitted to those fighters (LANTIRN), greater night capability will be realized. As an example, an F-15E can presently take off in zero ceiling/zero visibility conditions and can perform BAI and AI Missions at

night. It cannot deliver munitions in close proximity to forces in contact (CAS) in these same conditions because friend or foe cannot be discriminated. This discrimination problem will have to be resolved by pilot judgement in marginal weather or night for CAS aircraft.

d. Experiential data has resulted in regulatory weather minimums for aviators:

(1) In Europe, A-10 weather minimums in the target area are 1500 ft ceilings and 3 miles visibility for CAS training. It is expected that this will be waived to 1000 ft ceilings and two miles visibility in combat (a theater commander can waive weather minimums). Note: LANTIRN equipped F-16's in the future are expected to have some capability to perform CAS/BAI in 300 ft ceilings and 1-1/2 miles visibility.

(2) Weather minimums for departing runways are 300 ft ceilings and one mile visibility. Visibility can be waived to less than one mile.

4. Applied Data:

a. Based on the above regulatory weather minimums and the aircraft and munitions capabilities, the following are weather limitations applied to CAS missions in wartime:

(1) Departing runway minimum visibility will be 1000 meters (.6 miles).

(2) Weather in the target area: cloud height (ceiling) will be 300 meters (1000 ft.), and visibility will be 3250 meters (2 miles).

b. European Rhine Valley (Airfield Area) possible percentage of time when A-10's or F-16's could not leave the runway due to fog, haze, or mist (visibility less than the waivered 1000 meters minimums).

Time/Season	Winter	Spring	Summer	Autumn
2000-0200	7.1	0.9	0.6	6.5
0300-0900	8.7	3.3	3.4	14.5
1000-1400	6.9	0.8	0.3	4.7
1500-1900	5.0	0.1	0.1	1.4

c. European Lowlands (NORTHAG Target Area) possible percentage of time when A-10's or F-16's could not perform CAS.

Season	Time(00)	Occurrence Frequency (%)	Mean Visibility (3250M/Minimum)	Mean Cloud Height (300M/Minimum)
Winter	20-02	20.8	3102	143
	03-09	34.6	3071	138
	10-14	23.1	2697	143
	15-19	18.5	2834	147
Spring	20-02	7.7	4158	155
	03-09	14.2	3326	143
	10-14	9.6	3586	161
	15-19	5.3	3816	167
Summer	20-02	3.7	4701	159
	03-09	10.0	3511	145
	10-14	4.6	4275	174
	15-19	2.0	4904	172
Autumn	20-02	8.3	3140	141
	03-09	15.6	2546	130
	10-14	11.8	2906	148
	15-19	5.7	3333	156

Example: (Last line on chart) Autumn from 1500-1900 hours, cloud ceiling is less than 300m 5.7% of the time. When this

condition occurs the mean cloud height is 156M and the mean visibility is 3333M. The minimum on ceilings is the determining factor.

d. European Highlands (CENTAG Target Area) possible percentage of time when A-10's or F-16's could not perform CAS.

Season	Time(00)	Occurrence Frequency (%)	Mean Visibility (3250M/Minimum)	Mean Cloud Height (300M/Minimum)
Winter	20-02	26.1	3088	127
	03-09	30.6	3048	125
	10-14	28.6	3250	128
	15-19	23.1	3310	129
Spring	20-02	9.1	4093	124
	03-09	14.1	3628	125
	10-14	11.5	5574	131
	15-19	8.3	5950	119
Summer	20-02	6.2	5345	114
	03-09	11.4	4191	118
	10-14	8.8	7584	123
	15-19	5.7	8574	105
Autumn	20-02	12.3	3228	117
	03-09	21.8	2580	114
	10-14	16.9	4397	124
	15-19	9.1	5056	117

e. Due to weather capability of current and near term future CAS systems (and the possibility of fratricide), there is no "all weather" CAS. Visibility degradation due to weather affects all aerial platforms to include the helicopter; however, cloud ceiling effects are more limiting on fixed wing aircraft than rotary-wing (helicopter minimums can be waived to "clear of clouds" and 1/4 mile visibility). It should be noted that for the portion of time when CAS would not be available as indicated by the above target area charts, fixed-wing aircraft could still contribute to the fight by performing "shallow" BAI, since the need to discriminate between friend and foe in marginal weather is alleviated.

Senator THURMOND. Thank you.

General Logan, I would like you to provide for the record the life cycle costs of an F-16 wing, including manpower and operations and maintenance costs.

General LOGAN. Yes, sir.

[The information follows:]

F-16 LIFE CYCLE SUPPORT COST

General LOGAN. Assuming an operation life of 20 years, the life cycle cost of supporting an F-16 wing is approximately $3.9B (FY88$)

Military compensation	$1.6
Operations and maintenance	1.2
Sustaining investment	1.1

These estimates are based on F-16A Historical Data extrapolated to 20 years. It assumes a 72PAA F-16A wing, located in the conus, and averaging 377 flying hours/PPA the entire life cycle. The estimate does not include Class V modifications which change mission capabilities nor the initial investment to acquire the F-16 aircraft.

Senator THURMOND. General Logan, what are the minimum ceiling requirements for Air Force close air support operations in training and in war, and how does the weather in Europe impact on Air Force support of ground operations?

General LOGAN. Sir, I would like to give you the minimum training requirements for the record. They are obviously higher than they would be in actual combat, and they will vary somewhat by theater.

I would say that before you came in, I was talking about the characteristics of the aircraft that we would do close air support within the mid-1990s, and I specifically talked about the ability to operate at high sortie rates, at night, and in adverse weather. So you are right on target with that question.

And I have some of the minimums here. For peacetime in an A-10, we require a 1,500 foot ceiling and 3 miles and an F-4 or F-16, we require a 2,000 foot ceiling and 5 miles. Combat is typically 1,000 and 2 miles for both systems.

[The information follows:]

MINIMUM CEILING REQUIREMENTS FOR CLOSE AIR SUPPORT

Peacetime ceiling requirements for close air support operations vary by aircraft. Normally, A-10s require a 1,500 foot ceiling while A-7s, F-4s, and F-16s require a 2,000 foot ceiling. In war, actual ceiling requirements will vary with the theater and the tactical situation. Generally, minimum ceiling requirements during close air support operations will be driven by ordnance delivery parameters which will usually require a 1,000-foot ceiling.

Adverse weather in Europe can impact Air Force support of ground operations by limiting sortie availability and effectiveness. Ceilings less than 200 feet may restrict the launch and recovery of tactical aircraft. Target area ceilings less than 1,000 feet may preclude the employment of common close air support munitions.

A-10

Senator THURMOND. Speaking about the A-10, I believe they are stationed at Myrtle Beach in my State, the A-10s.

General LOGAN. Yes, sir.

Senator THURMOND. A good many military people never have thought too much of that plane. They say it is so slow it would be a sitting target. Do you feel that it would answer the purpose for which it was devised?

General LOGAN. Yes, sir.

Senator THURMOND. Or is there some other plane that we could use that would be better?

General LOGAN. I would never cast bad things on the A-10. I think it has done exactly what we designed it to do and asked it to do.

I think that as we move into the battlefield of the 1990s, we are now talking about a little different environment and that is why we need a follow-on airplane that can do the job in the 1990s as well as the A-10 has done since the mid-1970s.

The A-10 has been a very useful vehicle and it has been very good at its designed mission.

CLOSE AIR MINIMUM CEILING REQUIREMENTS

Senator THURMOND. I would like to ask General Sullivan a question. General Sullivan, what are the minimum ceiling require-

ments for Navy and Marine Corps close air support operations in training and in war?

General SULLIVAN. In training, it is very similar. Usually we have 1,500 feet and 3 miles to 5 miles. However, in wartime you go regardless. We have systems today that will get us to the target, and if you can see where you are going to provide it.

We have new systems today. We have the night attack Harrier and the F-18, and with night vision goggles and FLIR systems we have the capability to operate underneath this weather. If we can get there, we feel we can provide the support.

INF TREATY TRADE OFFS

Senator THURMOND. I would like to ask all of you this question, and we will just go down the line. In view of the INF Treaty that is now before the Senate, if it is approved then of course we lessen our ability from a nuclear standpoint. I think that is all agreed.

Now, what situation is that going to leave us in since the Soviets, since the Warsaw Pact countries, are much stronger than us in conventional weapons, stronger than NATO, which of course we are the heart of?

General LOGAN. Sir——

Senator THURMOND. A lot of people are very concerned, a lot of military people that talk to me, that we are going to give up a lot of nuclear power. The Soviets have the stronger conventional weapons, and the Warsaw Pact, than NATO.

Now, what situation is that going to leave us in?

General LOGAN. It is my view, sir, that as you pointed out, the INF Treaty will only affect the nuclear balance. We have a conventional capability vis a vis the Soviets today that exists whether the INF Treaty came to pass or not.

Senator THURMOND. It is not as strong as the Soviets, is it? Our conventional system is generally acknowledged to be less powerful than the Soviets' conventional weapons?

General LOGAN. It is clear that in pure numbers they outnumber either the NATO side or, more specifically, the United States side. As the distinguished chairman pointed out in his piece called "Beyond the Bean Count," there are many things to look at beyond just pure numbers, but it is pretty clear that numerically they are superior to us.

Now, whether the INF Treaty existed or not would leave the same conventional position that we are in today. That is my personal view, anyway.

General SHOFFNER. Thank you, sir, for that question. The role of tactical nuclear forces on the battlefield in my view must remain essentially as it is today, and those forces have got to be an integral part of the conventional forces that are forward deployed there.

In that regard, we must continue to provide the capability to hold at risk the lead operational echelons of the Red Army. If we can do that, then I think that we can deal with what evolves as a result of that.

Certainly, removing the longer range systems does in fact affect that particular part of the balance. It is my belief that the empha-

sis on conventional forces will become much stronger with those trades and therefore those current asymmetries and deficiencies that exist with those forces will be more urgent to redress.

So some of the things that we have been working on toward redressing major advantages where the Soviets currently have asymmetric advantage I think we must continue. The importance of tempo, the speed with which conventional operations will take place, in my view will be more important in the future, because the Soviets are leaning toward conventional operations without pause.

That seems to give them the advantage of speed. So the warning times on those scenarios I think will be revisited to see what is most advantageous from the Soviet perspective, and those shortfalls that we currently have in the force will have to be dealt with more urgently.

CONVENTIONAL BUILDUP

Senator THURMOND. The general impression I have gained in talking to the military people is that, since the INF Treaty will weaken us from a nuclear standpoint, is we have got to do more to build up from a conventional standpoint. Is that the case or not? I would like to hear from you gentlemen on that.

General SHOFFNER. Within the force adjustments that the Army would propose to make within the structure available in Europe, we will prioritize the fielding of conventional capabilities.

Senator THURMOND. Are the funds not sufficient to do what is necessary to build up conventional forces, or what is necessary?

General SHOFFNER. Those have been subjects of deliberation in the 1989 budget, as well as the current POM which we are working within the defense establishment. I think as that progresses, you will get a reflection of what those funds should be, sir.

Senator THURMOND. Mr. Fredericksen, do you have?

Mr. FREDERICKSEN. I apologize for being late. Conditions were somewhat out of my control this morning.

I think what the INF Treaty does for us is it makes conventional forces definitely more important, and I think getting the good close air support capability is an important part of that. I think follow-on force attack, the package of programs that contributes to that capability, is very important also.

With respect to whether we have enough resources to do that, I think that is questionable with recent cuts. I think our plans of the last 3 or 4 years—we are well on the way to getting the capability.

Remember, one advantage that NATO has over the Warsaw Pact is that we are basically in a defensive posture. If war should start, they have to come into our territory. They have to create gaps and extensions in their forces, expose flanks, which we can take advantage of.

If we invest in the right kind of systems, barrier programs, very reactive systems like good close air support, follow-on force attack programs to deliver large amounts of fire support at the point of attack and in the second echelon areas, if we invest in good surveillance systems so we can deny surprise, the odds that are presently available to the Warsaw Pact at the front of about 2½ to 1 are not sufficient.

With surprise, it could be devastating. But without surprise, I think that there are serious questions whether they can achieve their objectives, provided of course that we have responsive systems that can create high levels of attrition early in the war.

Senator THURMOND. General, would you identify yourself? I do not believe there is a sign with your name on it. You have got "Dr. Moore" there and you do not look like a doctor to me.

General HOPKINS. My name is John Hopkins. I am the Director of Operations, Headquarters, Marine Corps.

And my only comment to add to those that have preceded me is that, even though your enemy may have superiority in conventional forces—but sometimes when you use the terrain and you use the individual marine or soldier to the maximum capability, you can offset numerically superior forces, because they are better trained or they may have better weapons systems to either defend or to attack.

I agree, though, from a philosophical point of view that we may have to look at our conventional forces and see if the current decrements in the structure will impact Marine Corps capabilities. I do not know whether or not we can really meet the Russian superiority in conventional forces.

It appears to me that we have to look very carefully at the structure to make sure that we have the capability within the structure to take them on. Of course, the Marine Corps is not on the central front. We are on the northern and southern flanks, and it is a little different ballgame in how we would attack that.

So that is what I would say. There is more to it than just numerical superiority in total forces.

Senator THURMOND. General Sullivan.

General SULLIVAN. Yes, sir. I would like to comment on that.

I agree with the decrements we are taking. However, I am a wing commander who is going to war tomorrow with what I have today, and I would feel pretty good about it because we are away from the 8,000 foot strips. We have a VSTOL airplane that can land anywhere in Germany. In West Germany alone there are 145,000 sites. Most of these sites are on roads of 1,000 feet.

This gives us the capability to continue to operate even with most of the hard surface runways destroyed. We can still do the job.

Senator THURMOND. Thank you, Mr. Chairman. My time is up.

ADVANTAGES OF WARSAW PACT OVER NATO

Mr. FREDERICKSEN. Senator, I would like to make one more comment, please, with respect to the advantage of the Warsaw Pact over NATO.

In the air I do not feel they have an advantage. They outnumber us, but we have better airplanes, better missiles, and much better pilots.

If there was a war in the near future, I think NATO would take control of the air rapidly. And that is one reason we have to use this air power to help our deficiencies on the ground, and that is why close air support is——

Senator THURMOND. The main thing I want to get is, the impression from talking to military people today is, if we sign this treaty we have got to do more to improve our conventional weapons systems. Now, is that the case or not?

I mean, that is what I was trying to get at. If so, what will it take to do it? The Congress ought to know this.

General LOGAN. Sir, from the Air Force perspective, we would certainly solicit support, we would solicit your support for those systems that we currently have in development that will add to our conventional capability worldwide.

Senator THURMOND. You do feel a need to do more to build up conventional forces if we sign this treaty?

General LOGAN. I do not believe that the two are related. However, we certainly need to continue to modernize and continue with an increase in our capability as we look to the future and the future threat, both conventionally and as a result of INF or START that might occur.

Senator THURMOND. You better speak out now or forever hold your peace, because Congress is going to act, and we have to depend upon you military people to tell us frankly and honestly what you believe.

General SHOFFNER. Sir, I would note that, while General Logan and I agree on many parts of how to fight and what the close air support requirement is, I think I would differ with his view on the conventional force piece, given the forces that exist in Europe.

With the INF, the shortfalls that we have been living with in the conventional forces in my view must be redressed. We can go down a list of what those are from a priority standpoint if it is helpful to you. With the likelihood of that level of war, and given the higher theater nuclear pieces coming off, in my view it is a very significant problem for us. It requires improvement in both the tactical nuclear forces as well as the conventional forces.

Senator LEVIN. Thank you, General.

CALL FOR CLOSE AIR SUPPORT

Before we get to Mr. Fredericksen, I want to get the process down right. When there is a call for close air support for somebody, say in a platoon, that call goes where? Does it go directly to an A-10 or does it go to a battalion and into a brigade and into a division and into a corps?

Follow that call for us.

General LOGAN. Sir, there is a track. It would go through the forward air controller, through the commander at the battalion, then the request would be made, to the ASOC, or Air Support Operating Center. Then a decision would be made to service that call.

The call then would go to the fighter in flight and he would be assigned the mission.

Senator LEVIN. All right, so that it could go through three or four or perhaps even—how many different points?

General LOGAN. On an immediate, it goes right on to the ALO net and the decision is made to service it and it goes direct to the pilot in the airplane.

Senator LEVIN. I understand, but let us take it step by step. You are now in a platoon, you need close air support. You put a call in. Where does that call go over your radio? To whom exactly?

General LOGAN. Back to the battalion.

General SHOFFNER. Sir, that goes within the net. That is a request that goes up, that is seen by the ASOC, the Air Support Operations Center, at the corps.

Senator LEVIN. Is that the first place it goes, to the corps?

General SHOFFNER. Sir, it will be reviewed in between.

Senator LEVIN. No, I just want to do it in between. Just start at the bottom and do it in between for me.

General SHOFFNER. Immediate has a special feature in that silence is consent, so it is not processed through all of the intermediate layers unless someone says, I can handle that and do that job for him.

Senator LEVIN. Okay.

General SHOFFNER. That is an important feature that keeps some guy down at the bottom from unplugging the whole sink and letting it come down on top of you.

Senator LEVIN. The call is heard right away instantaneously at all levels?

General SHOFFNER. It is monitored through a variety of levels that may have the capability to meet that man's need.

Senator LEVIN. Can you work through this with me step by step? Just try to follow my questions. The call is heard simultaneously at all levels, is that right?

General SHOFFNER. That is correct.

Senator LEVIN. Someone in a platoon says, I need close air support; everybody up and down that net hears it. If somebody at the brigade level can handle it, it is handled. He will speak up. If he does not speak up, within how many seconds or minutes will it then go to the next level?

General SHOFFNER. Three is the answer, 3 minutes.

Senator LEVIN. If somebody at the brigade level does not respond within 3 minutes, it then will go where, to the division level?

General SHOFFNER. That would be within the corps ASOC. That is the level where it is managed and from a planning standpoint, the integration of the air and maneuver takes place.

Senator LEVIN. So that if no one between the platoon, if that is where it originates and the corps level picks up that request within 3 minutes, the corps then is responsible to act on it, is that correct?

General SHOFFNER. And he then will——

Senator LEVIN. Excuse me. Is that correct? Just work through this with me if you would.

General SHOFFNER. Yes, sir.

Senator LEVIN. Okay. Now, is there an Air Force officer at the corps level?

General SHOFFNER. There is.

Senator LEVIN. And that air officer, that Air Force officer, if nothing happens within 3 minutes will then put that call into the tac air operations center? Is that where it goes?

General SHOFFNER. We have, as you know, within the corps tactical operations center, elements of the ASOC embedded that are

monitoring what fighters or what close air support are being moved back and forth between the flight and the air base.

Senator LEVIN. Where is this center? Is that at the Army corps or a different location?

General SHOFFNER. The ASOC may be physically sited at a location different than the corps tactical operations center. They are linked with communications and they should share the same information, so they see the same picture.

But inside the corps tactical operations center is an element of that ASOC that can deal directly with the ground force, typically G3 operations and the fighter duty officer.

Senator LEVIN. The Air Force center could be in a different location?

General SHOFFNER. Yes, sir, but the ability to control is embedded inside the corp.

Senator LEVIN. In order to get our loitering plane, for instance, to get some ordnance on target, that Air Force office that is with the Army corps has got to put a call in to the ASOC?

General SHOFFNER. He would direct that through the ASOC and then the TACC.

Senator LEVIN. Get away from acronyms for a moment. You have got an Air Force officer with the Army corps. He is doing the listening; 3 minutes, nothing happens. He then goes across to an Air Force center an ASOC, where he then puts the request in for the close air support, is that correct?

General SHOFFNER. He should know, sir, at that level if he has anything that is immediately available or that is being brought into the site in the near time frame which can be diverted into that immediate request.

Senator LEVIN. Can he give the direct order to the pilot to put close air support from the Army corps level?

General SHOFFNER. He will direct the pilot down to the forward air control party that will do the actual designation of the target.

Senator LEVIN. If you can follow my question, does the pilot get a direct order from the Army corps air officer or must it come from ASOC?

General LOGAN. It comes direct from there, from the Air Force office at the corps levels, who will look at—either he has got aircraft holding for his corps, or inbound to his corps, or he can scramble from alert; make the decision to divert, tell the pilot, authenticate the message, and the pilot will then contact the FAC and be placed on target.

Senator LEVIN. So it does not have to go through ASOC?

General LOGAN. They are on board, they are on the same net, and he is the ASOC. He is part of it.

General SHOFFNER. He is part of the ASOC that is embedded there with the corps TOC.

Senator LEVIN. Does the center, the Air Force center, give the order or can that direct order come through the Air Force officer at the Army corps level?

General LOGAN. If they are scrambled from sitting on the ground, the Air Force center scrambles them. If it is an inbound already designated for that particular unit, he is diverted right there from that ASOC.

Senator LEVIN. Do I understand, then, he is directed from the Army corps level by an Air Force officer?

General LOGAN. If he has inbound assets.

Senator LEVIN. In that second situation?

General LOGAN. That is correct.

Senator LEVIN. Senator Thurmond.

Senator THURMOND. I do not have any other questions. Thank you, Mr. Chairman.

TIMETABLE STUDY ON MODERNIZING CLOSE AIR SUPPORT

Senator LEVIN. Let me get the timetable for the study on modernizing close air support. When is that study going to be completed?

General LOGAN. The study is supposed to be completed by the end of March, I believe. And we will have an answer from it by October of this year.

Senator LEVIN. You are saying that the new close air support plane that the Air Force is now planning on producing is scheduled for the same time period as the new fighter, the ATF, mid-1990s? Is that what you said?

General LOGAN. Yes, sir.

Senator LEVIN. Is that going to be possible, given the amount of money which the Air Force is currently allocating to the ATF compared to the amount of money which it is allocating to the new close air support plane?

General LOGAN. Both are possible within the budget constraints the Air Force is currently working in, yes, sir.

Senator LEVIN. As I understand it, you have got $700 million in this year's budget for a new fighter, but there is nothing in there for a new close air support plane except a study. Given that allocation of resources, how are you going to be able to produce these two planes, performing different functions, in the same time period, in the mid-1990s?

General LOGAN. Once again, I would say as early as 1985 we attempted to put money——

Senator LEVIN. I understand the history. But given the current situation where you have got a study under way for the close air support plane, whereas you have got a real commitment of assets, $700 million this year and I think $13 billion over the next few years, to your new fighter, given the contrast in the amount of money that you have in this year's budget request for those two new planes, how do you expect that they will both be ready about the same time in the mid-1990s?

General LOGAN. If the study produces results that lead to the modification or adaptation of an in-production fighter aircraft, then the research and development and associated moneys will not be necessary for that vehicle.

NEW CLOSE AIR SUPPORT PLANE

Senator LEVIN. So the only way that you would be able to produce a new close air support plane in the mid-1990s is if you would use a follow-on to the F–16?

General LOGAN. No, I would not say only for the follow-on for the F–16. There could be modifications to enhance the A–10. There are a number of answers that might come. If the product is a modified missionized version of the A–16 or F–16, then yes, it would be——

Senator LEVIN. But if there were going to be a new plane designed for close air support, you would not be able to meet the mid-1990s timetable?

General LOGAN. I would have to go back and look at the time frame, but it would be difficult by the mid-1990s.

Senator LEVIN. So the mid-1990s statement referred to a modification of either the F–15, F–16, or A–10, is that basically true, or perhaps the Harrier?

General LOGAN. The term "mid-1990s" that I have used this morning is defining the battlefield of the mid-1990s as the U.S. Army saw it. In the mid-1990s, we will then have to produce an aircraft to fly close air support, so that is the connection.

F–16

Senator LEVIN. Mr. Fredericksen, it is your turn. But why do you not start by answering the question: Just how good is the F–16 for close air support? Can you start with that?

STATEMENT OF DONALD N. FREDERICKSEN, DEPUTY UNDER SECRETARY (TACTICAL WARFARE PROGRAMS), OFFICE OF THE SECRETARY OF DEFENSE

Mr. FREDERICKSEN. In the fall of 1986, the Air Force presented to OSD a plan which included upgrade of the A–7 fleet. We have some 330 A–7s which are in the Air National Guard and Reserves.

The second part of the plan was to replace the A–10s with a variant of the F–16 called the A–16.

We did not think that was the best we could do. We think that has a lot of compromises associated with it. The F–16 is a high performance fighter. It is a marvelous fighter. It is one of the two best fighters in the world within visual range. It is easy to own on a relative basis. Its procurement cost is relatively low.

And of course, the Air Force has a whole infrastructure to support it. So, it is not surprising that this was an appealing answer to the Air Force.

However, there are a number of problems with it as a close air support aircraft. It is not built to fly low, low and slow and look for targets. Its maneuverability is not as good as we think we could get in a dedicated close air support aircraft.

It has, for example, an 1,800 foot minimum turning radius, as opposed to the A–10, which has approximately 1,400 feet. One of the main things wrong with it is it is a relatively soft airplane. Its vulnerable area to machine guns up through 23 millimeters is very much higher than that of an A–10.

Of course, the A–10 was designed from the ground up to be a very survivable aircraft and the Air Force paid a lot of attention to reducing its vulnerable area. We think that in a new airplane that could make all the difference in the world in its flexibility and its ability to operate in a high threat environment.

Senator LEVIN. Have you then basically decided that we are going to need a new plane that is dedicated to close air support? Is that basically where the OSD is coming from?

Mr. FREDERICKSEN. The OSD position was, let us set aside A-16 for now because maybe there are some things we should do to harden the A-16, that is a possibility. But let us take a look at what is out in industry, let us see what ideas are out there for new airplanes.

We are not talking about a program that is competitive with the ATF. We are talking about a $3 billion development program perhaps, as opposed to a $13 billion or so development program for the ATF. We are talking about a fly-away cost of $10 million or below which we think is achievable, as opposed to a fly-away cost of $35 million, which is the ATF goal in 1985 dollars.

So we are talking about a much more modest program than the ATF program. We are talking about a slightly different time frame also, a little bit later than the ATF. But it is not clear in our own mind that this cannot be fitted in.

As a matter of fact, the Air Force's own scientific advisory board, in studying the program, felt that we could fit in a new close air support aircraft of the kind of airplane that we are thinking about, which is a relatively small airplane, somewhere between maybe 10,000 and 20,000 gross weight aircraft, as opposed to the A-10 which is like a 40,000-some pound gross weight aircraft when it is loaded up.

We are talking about an airplane that does not need a lot of fancy avionics on it. It probably needs a FLIR, target handoff devices, a navigation system and a laser spot tracker. Things like that.

We think that such an airplane is going to be relatively inexpensive. So we think there is a potential there, but we need to see what these ideas are and see what the effectiveness and the cost of these new concepts are before we decide whether we should go with a variant of an existing airplane, a modification of an existing airplane, or a new aircraft.

Senator LEVIN. There seems to be a different point of view expressed between OSD and the Air Force on this. Is the source of that difference mainly money or is there a philosophical difference as well?

Mr. FREDERICKSEN. My view is that we have in OSD put more emphasis on the dedicated CAS mission than we believe the Air Force puts on the mission. I think the Air Force does not disregard it, but in our priority of things, it is higher. So yes, there is a philosophical difference between our position and the Air Force's.

Senator LEVIN. The Office of the Secretary of Defense has a different emphasis on mission, but it is not mainly a matter of where the $3 billion comes from, whether it is out of the Air Force's hide or some other part of the defense budget?

That is not the real issue, assuming that a new plane was a $3 billion item?

Mr. FREDERICKSEN. If it makes sense, we should be able to find the money somewhere.

Senator LEVIN. I do not mean that. The difference in the perspective is not based on a question that the Air Force has about where

they come up with the $3 billion, if that is the cost of this plane. There is more of a philosophical than a fiscal basis for the difference in perspective, is that accurate?

Mr. FREDERICKSEN. I think there are economic reasons, too, for the Air Force's position. As I said, the F-16 has a whole infrastructure. It is a relatively low cost airplane to own. It is a relatively low cost airplane to buy now compared to a lot of other airplanes we are buying. And from their standpoint, adding more F-16s or A-16s has some economic payoff, too.

So on the other hand, until we see what the new offerings look like, I do not think we should jump on something that we regard as a significant compromise in terms of achieving it. The F-16 is good at interdiction missions, battlefield interdiction, but we have airplanes that do that now. The swing role F-16 can do that fairly well, and the F-15s can do it. Other airplanes can do it, also.

But we only have one aircraft that was designed from the ground up to be a close air support aircraft. I think it is reasonable to look at replacing that with another one that was designed from the ground up to do that.

Close air support is a very demanding mission. It is a hazardous mission because one has to get in close. The question was asked, how about standing off? The problem is that the situation changes. Targets are time urgent. What you want to avoid at all cost is fratricide of your own forces.

So often you have to get in very close and you have to be in close coordination with the ground forces in delivering ordnance, and you have to be hitting the targets that are most dangerous to the friendly ground forces in a very timely manner.

Doing this from standoff has a lot of appeal from a survivability standpoint. But frankly, we do not know how to do that today.

AV-8B

Senator LEVIN. Can you give us your assessment of where the AV-8B fits into all of this?

Mr. FREDERICKSEN. The AV-8B is a very good airplane from the air base flexibility standpoint. From the Marines' standpoint, it is a very good answer for their basing needs because they can transition ashore in almost any area of the world.

They do not need long runways from which to operate. It is a very maneuverable aircraft. It depends on its survival through hit avoidance. There are two aspects of survival. One is threat avoidance, not getting hit; and the other is threat tolerance, that is tolerating the hit and coming back without being shot down.

The AV-8B depends on its survival from the first of those two rather than the second. However, it is a relatively soft airplane also.

We have a plan not to change the hardness of the airplane by almost 50 percent by putting in a halon gas fire extinguisher system into the voids and into the tanks of the AV-8B, which would reduce its vulnerable area about 50 percent.

As you probably are well aware, Senator, fire has been a cause of lost aircraft a high percentage of the time in Southeast Asia and in

other wars as well. If we nearly reduce that to zero, we can raise the survivability of the aircraft a lot.

Senator LEVIN. When you said not getting hit, did you mean in the air or on the airfields that are being dispersed?

Mr. FREDERICKSEN. I was referring to in the air, but flexibility of basing actually helps you not get hit in the base as well. So the shorter the runway ability to take off, the more flexible we are.

One of the things we would like to see in a new aircraft is the capability to take off and land in a short distance, like 1,000 to 1,500 feet. The Harrier or the AV-8B version of the Harrier has a payload and range that is roughly equivalent to an F-16 when it uses 1,200 feet, and that is very attractive.

So we do not have to have vertical takeoff necessarily, although that increases over basing flexibility a lot. The ideal close air support aircraft would have a very short takeoff and landing requirement. That is a very desirable characteristic.

Senator LEVIN. Are we looking at the AV-8B as one possible answer to a new close air support plane?

Mr. FREDERICKSEN. Yes, that will be studied.

Senator LEVIN. That is part of the current study?

Mr. FREDERICKSEN. The six contractors have seven studies on which they are embarking. All but one of them, I believe, is associated with looking at new aircraft designs. One of the two that General Dynamics has is involved in looking at A-16 as a solution.

Senator LEVIN. Why are we not looking at the AV-8B?

Mr. FREDERICKSEN. In these studies we are not, but we have a lot of other study efforts ongoing. In the next month we will have a study with RAND, and another one with IDA. Over the last year and a half, we have had IDA working in this area.

We also have, through the Air Force, two independent contractors who are going to look at all of this.

Senator LEVIN. Again, you are including the AV-8B?

Mr. FREDERICKSEN. Yes, and also an A-10 variant. We think we need to look closely at modifying the A-10, as well as looking at AV-8B variants.

Senator LEVIN. Why is the Air Force not looking at the AV-8B as one of its options?

General LOGAN. The part of the study that Dr. Fredericksen is talking about is an Air Force effort.

Senator LEVIN. What is the general Air Force view of the AV-8B?

General LOGAN. In 1979 we did a close look, a study of the AV-8 as a possible aircraft for Air Force procurement. At that time there were penalties paid both in range and payload for the vertical takeoff capability. In view of the availability in most of the areas around the world and the Air Force infrastructure, it was determined that both economically and mission requirement-wise the AV-8 was not suited for, not best suited for Air Force operations.

So that was in 1979. It was reviewed briefly again in 1985 and, as Dr. Fredericksen stated, we will look at it again this year.

Senator LEVIN. You are in the process of looking at that?

General LOGAN. Yes, sir. It will be reviewed along with other in-production aircraft for replacement for the close air support vehicle.

Senator LEVIN. Are you also assessing what reduction of the AV-8B unit cost would be expected if it were produced at a higher rate to fulfill an Air Force buy?

General LOGAN. The realistic cost profile based on an increased production rate, yes, sir.

Senator LEVIN. What are those numbers?

General LOGAN. I do not have those.

Senator LEVIN. Would you supply those for the record?

General LOGAN. I think so, sir, and they will come down more comparable to the F-16 than they are now.

[The information follows:]

AV-8B UNIT COST

We have found it difficult to assess AV-8B unit cost in a vacuum without considering the limited avionics package available for the Harrier (no radar, no internal jamming, etc). The Harrier, not being part of the present Air Force fighter force, would require we establish a complete logistics infrastructure, maintenance training and pilot training school and peculiar military construction to support the airframe, engine, and avionics.

Without considering the above infrastructure needs, on a pure unit cost basis, it would be reasonable to assume the AV-8B (at an increased production rate) would be of comparable cost to the F-16.

ATF BUDGET FIGURES

Senator LEVIN. Mr. Fredericksen, could you give us the budget figures for this year on the out-years for the ATF compared with a new close air support plane? Do we have money budgeted for the next 5 years?

Mr. FREDERICKSEN. For the ATF we do.

Senator LEVIN. What is the amount, say, for the next 5 years for ATF? Would you know offhand?

Mr. FREDERICKSEN. It is about three-quarters of a million. I think.

Senator LEVIN. Of a billion?

Mr. FREDERICKSEN. I mean of a billion.

Senator LEVIN. I think that is just for this year.

Mr. FREDERICKSEN. That is for this year, and I think that number is about the same for the next year. Then it will start to go up higher than that. I would say for the next 5 years, rough guess, something like $4 billion in development.

Senator LEVIN. And how does that compare——

Mr. FREDERICKSEN. That could be wrong, though. I mean, I would like to provide that for the record.

[The information follows:]

AIR FORCE ADVANCED TACTICAL FIGHTER

Five-year funding for the Air Force Advanced Tactical Fighter is as follows:

[By fiscal year in millions of dollars]

	1988	1989	1990	1991	1992
63230F					
64239F			[Deleted]		
Total					

Senator LEVIN. That would be fine.

How did that compare roughly to the amount of money that we are projecting for a new close air support plane?

Mr. FREDERICKSEN. We do not have in our budget or in our 5 year defense plan at the moment the new close air support aircraft. I think that is one of the issues that we are going to be dealing with in the POM 90 as we put the new 5 year defense plan together.

But as I said before, what we are talking about is, ATF is like a $13 billion development. We are talking about like a $3 billion development program.

Senator LEVIN. Even a $3 billion development would take quite a bit of money in the next 5 years, would it not?

Mr. FREDERICKSEN. Probably the first two would not be so bad, but yes, you start to ramp up.

Senator LEVIN. What is your timetable for a decision in OSD?

Mr. FREDERICKSEN. When we started this study, we were hoping that we would have answers in time for the POM, by late spring. The studies were started late because of a number of delays. They were not started until the beginning of the year and we are now expecting answers. Originally we were expecting answers in March and now we are expecting the answers in the June–July time frame, which means by the time we analyze the results it will probably be early fall.

So we will be in time for the budget, but we may have to put in some sort of a place holder as far as the 5 year defense plan. I am not sure how we are going to handle it.

Senator LEVIN. Put in a place holder?

Mr. FREDERICKSEN. We are going to have to make some estimates that are not based on specific configurations and then alter those when we get better information.

Senator LEVIN. Then that plan would be issued when?

Mr. FREDERICKSEN. In the fall.

Senator LEVIN. You may not have the final figures by the fall, but you think you will be in a position by the fall to decide whether or not to leave a hole or a place in that 5 year plan for a new close air support aircraft?

Mr. FREDERICKSEN. Yes, sir, that is what we are hoping for.

AV–8B

Senator LEVIN. Let us hear from the Marines on AV–8B. Give us your assessment of it if you would for the record.

General SULLIVAN. I have been flying the airplane now for about 14 months. I am a fighter pilot. I grew up that way for the first 29 years. I really did not think too much about VSTOL because you are so busy doing other things, but in the last 14 months the corps has gotten a convert, not because it is the AV–8B, but because of its capability and flexibility.

Looking at the basing flexibility, we just did a study on a situation similar to Honduras. Right now there are three airstrips where we can put conventional airplanes. For Harriers, they have around 173 sites.

After we get there, we can operate Harriers out of forward bases. These forward bases are 25 to 75 miles behind the lines. What can we do? The AV-8B has a surge capability of six sorties per day and a sustained rate in combat of five sorties per day.

The AV-8 rate is 3.6 sorties per day and the F-18 about three, when operating out of a main base. As you can see, the capability that VSTOL gives you is the wave of the future. The technology is there.

I flew with the Royal Air Force in 1960 and 1961 through an exchange program, and I watched the 1127 Kestral fly at Farmborough. Today, the two airplanes still look alike, but the AV-8B is totally different. The mistake we made is calling the AV-8B Harrier 2 instead of calling it something else. It may look the same, but it is a completely different airplane.

The fact that the AV-8B can operate off a ship, an amphibious ship, really raises the numbers when you cannot get an aircraft carrier in there or there are no land basing rights.

In sheer numbers, what we need is more of them. This would bring the unit price down. But the people who fly it—and a lot of people here in this room have had rides in it—it shows you. It makes a believer out of you. It is worth a thousand words to see its capability.

Senator LEVIN. Now, the difference that you have described in terms of the number of sorties for the AV-8B or the VSTOL is something like 2 to 1?

General SULLIVAN. Yes, sir, it is 2 to 1.

Senator LEVIN. What other advantages does it have?

General SULLIVAN. It is the response time. In order to respond in 5 minutes, and it is probably not very realistic unless you are flying an airborne cap. We did this in Vietnam; however that uses all your fuel.

In Vietnam, we would go out on a "dumpex" because we could not stay up there forever. We would fly out and just take any target of opportunity and waste our ordnance.

The way to get around this is to keep the aircraft on the ground and have them ready to provide instantaneous response. Twenty-five miles back in hides, as we call them. I question the wisdom of going someplace where we do not have a road—you can have these airplanes on target immediately.

You do not have to carry 12 bombs. The AV-8B will do with four to six. We also do not take off vertically. That capability is with the gun pods only. It can do it with 5,000 pounds with today's engine. Our new engine which is coming will give you a little more capability.

What we normally do is roll 200 or 300 feet on a short take off (STO). When we return from a mission, we can make a vertical landing or a rolling vertical landing. This gives you the capability of turning these airplanes around rapidly. We flew the AV-8Bs, landing and arming each sortie. Flying 77 sorties with 11 airplanes in an 8 hour period off roads, this is capability.

The AV-8B night attack version. I wish I could have brought the FLIR tape that we have. We are flying the prototype now, but it will be productionalized and flown operationally next year. It has a

FLIR in it and it has night vision goggles, these are cat's eyes, night vision goggles that you look through.

The pilot landed at Camp Lejeune on a road, a road that is not wide enough for two six-by's to pass head-on and there is not a single light. Everybody is out there watching. You just hear this whistling jet come in, it lands, a rolling vertical landing at 55 knots, comes to a stop in a very short distance. A distance less than the size of a football field.

The pilot is looking at everything through his FLIR night vision goggles, and what you see is two raccoons run right in front of the airplane as he lands.

That is capability to be able to have that.

Senator LEVIN. Okay, Mr. Fredericksen, we did not get your opening statement. If you would like to summarize it or add anything that you have not already said or put it in the record, whatever you would like to do, we will welcome it at this time.

You do not have to go over material we have already covered, but feel free to address it as you wish.

Mr. FREDERICKSEN. As I said, close air support is probably the most demanding of the three primary air to ground missions, interdiction and battlefield interdiction being the other two. It is a mission environment where there are several different kinds of weapons firing up in the air.

The Soviets on most of their armored vehicles have 12.7 and 14.5 millimeter machine guns, and they train their crew members to fire in the air at aircraft. They also train their infantry to do the same thing with their AK-47s and other weapons.

In addition, they have a lot of specialized air defense systems, today the ZSU-23 and tomorrow an upgraded version of that with larger caliber guns. That is the environment that we are operating in in the Central Front.

We think to do that job well takes an airplane that is designed from the ground up to do it, rather than trying to make do with something that has not been designed for that mission.

Let me give you an interesting sidelight. Two summers ago I was in Europe visiting some of our major air bases there, and I stopped at an F-16 base as a part of that. I found that they were employing that aircraft in its swing role mission, air-to-ground, as well as air-to-air. They practiced about almost two-thirds of the time in the air-to-ground role with that aircraft.

And I said, what percentage of the time do you spend on close air support? The answer was zero. I said, why is that? They said: Sir, this airplane was not designed to be a close air support airplane. That was their reaction to it.

Now, you could modify it somewhat to make it better at that mission, and any air-to-ground airplane can do that mission. But to do it really well, we think that we must have an airplane that is designed for that.

The A-10 program was an interesting one. In a prior tour in the Pentagon, that program was under my jurisdiction. Major emphasis was on lethality of the system. It was built really around the GAU-8 cannon, a seven-barreled Gatling gun with a high rate of fire and a high velocity round that can penetrate any tank in the world, side, back, and top, but not in the frontal 60 degrees.

The survivability of the airplane was one of its key aspects, where they built the airplane from the start to make it a very hard airplane. There is a very good live fire test program at Wright Patterson Air Force Base. They subjected different parts of the airplane, including wings loaded with fuel, to hits with 23 millimeter HEI. And they carefully designed that airplane so that it was a tough airplane.

We are smarter today than we were then. We could design an airplane that is a lot smaller. Technology has brought along propulsion systems that would allow us to carry enough payload in a much smaller airplane. We need, of course, simplicity and responsiveness that we designed into the A-10 as well.

As I said, short takeoff and landing has much appeal as far as basing flexibility, as General Sullivan emphasized. I think that is very important.

Now, from the Air Force's standpoint, they have an infrastructure of bases in Europe. But it would be nice to be able to use some of the smaller bases, and there are lots of smaller bases with shorter runways. It would also be nice to be able to operate off of grass fields and roadways, because then it would be very hard for the Warsaw Pact to shut down those airfields.

Senator LEVIN. Just on that one point, I was in Europe recently and saw the AV-8B. I believe it was based in a garage. It looked just like a regular garage right off of a road.

So the capability of hiding these assets is tremendous, in getting them away from airfields, which are just fixed targets known to the Warsaw Pact. The capability of placing them anywhere, of storing them anywhere, is a great advantage which you were referring to.

A-10

Mr. FREDERICKSEN. I should point out where we stand on the A-10. I think if you talk to a lot of A-10 pilots, they all come up with the same conclusion; it is too sluggish an airplane, it is not agile enough, it is underpowered. In a high degree per second turn it loses power and altitude.

It is also very large and so, even though it is tough, we have to worry about combat damage and getting hit and having to be repaired before we put it back into service.

It still, though, is a possibility that we could up-engine, and there are some proposals on the table, for example putting 404 engines in it, which would up the speed almost 100 knots, up its agility a lot. But we still would be stuck with the relatively large size of the aircraft.

But, the basing flexibility would still be tied to the current aircraft, which is like 3,000 feet runway required.

Senator LEVIN. Going to the physical area of the plane itself for a moment, you just made reference to the A-10. What about the F-16 compared to the A-10 and the AV-8B compared to both in terms of area?

Mr. FREDERICKSEN. The A-16 has approximately seven times the vulnerable area of an A-10. I have a classified chart on that.

Senator LEVIN. Do not do that right now. Are you able to give us an unclassified comparison on the AV-8B?

Mr. FREDERICKSEN. It has a little larger vulnerable area than the F-16, but if you do the halon gas program that I talked about earlier, you could take that down by over 40 percent, and so it looks a lot more attractive. There may be some other things that we can do as well to reduce its vulnerable area.

The best you can do, of course, is to start from the ground up and design it right from the beginning to be hard, like the A-10 was.

CLOSE AIR SUPPORT AIRCRAFT COST

Senator LEVIN. Do you have any idea on the cost comparison? You have given us a ballpark figure on a new close air support aircraft, $3 billion. I am just using that as a ballpark figure.

Mr. FREDERICKSEN. Believe me, it is ballpark.

Senator LEVIN. I am sure it is. How generally would that compare to a modification of the A-10 or F-16?

Mr. FREDERICKSEN. I would expect a modification to be in the hundreds of millions of dollars, rather than in the billions of dollars. And it depends on how extensive the modifications were, of course.

If you really wanted to reduce the F-16 vulnerable area a lot and increase its load, speed and maneuverability a lot, you would maybe be in a half-billion dollar category.

Senator LEVIN. It might be from 5 to 10 times more expensive to come up with a new close air support aircraft than a modification of the A-10 or F-16?

Mr. FREDERICKSEN. Possibly. I would say it could be easily five or six times.

Senator LEVIN. This is a situation where we may be deciding—may be deciding, because we have not yet decided—to invest in quality instead of quantity, is that true? I mean, is that the decision point we are going to be at in the next year?

We may go for fewer of more capable aircraft that can carry out the close air support mission, instead of more of less capable aircraft?

Mr. FREDERICKSEN. I think there are two parts of the investment. One is the fixed part, where we invest in the development, and there it'll cost us more to get a new aircraft than it will to modify an existing aircraft.

The other part of it is buying the aircraft itself. The kind of characteristics that seem to be appealing in the studies that we have seen so far, the IDA and, as a matter of fact, the Air Force's own scientific advisory board study, the kind of characteristics that we are talking about would result at a lower cost than an F-16.

So once we get through the development, you could easily be paying less money. So we would go for more quantity in that case, and hopefully better quality as well.

Senator LEVIN. You have indicated that the AV-8B is going to be included in the close air support study one way or another?

Mr. FREDERICKSEN. Yes, sir.

LHX

Senator LEVIN. What about the LHX being included in that study?

Mr. FREDERICKSEN. We feel if you think of two set diagrams overlapping each other, I think there is an overlap where helicopters and fixed wing aircraft compete with each other. But there are a lot of places where they do not, and I think they are complementary more than they are competitive.

Helicopters—and by the way, you may be familiar with joint air attack team exercises that have been going on with the Army and the Air Force for, I do not know, 5 or 6 years, something like that. These are very successful. The helicopters try to kill the specialized air defense systems. They help the fixed wing aircraft in finding the targets and they help them in exiting the area by suppressing and killing the air defense systems.

Helicopters are good in situations where you have, of course, the right kind of terrain so the helicopters can keep masked until they have a high probability of having a target.

They are good in situations where they know where everybody is, where they have good knowledge of where the enemy's position is, because if a helicopter stumbles on enemy forces at close range, everything is dangerous to it. A tank company is dangerous to it.

So it wants to stay back. Our Army aviation pilots work hard at developing tactics where they stand off at long range and can pick off armored vehicles and air defense systems and go back into mask almost before the targeted systems know what has hit them.

Fixed wing aircraft are not nearly so sensitive to knowing where everybody is. They need to know where the targets are, obviously, and get keyed to the targets, especially in close air support. But they are moving faster and so they are much harder to hit with all these threats.

A main tank gun is dangerous to a helicopter at 2 kilometers, for example, or 1 kilometer, where obviously it has no play at all with fixed wing aircraft.

So we see attack helicopters as being complementary to fixed wing aircraft. There is nothing like the massing capability of fixed wing aircraft. We can bring a lot of firepower to bear in a very short amount of time.

We have an air power advantage, and we should continue to work hard to preserve that. That is one of the reasons we support the ATF program, because it is another step in improving our air superiority and maintaining that advantage. That is very important.

We need to use this fixed wing air power to help us overcome numerical deficiencies on the ground. Helicopters can help in the application of that fire power, but I do not think they are a substitute for it.

Senator LEVIN. You were in the middle of or near the end of your presentation. Do you want to proceed?

A–10 AND F–16

Mr. FREDERICKSEN. The Institute of Defense Analysis did a study for us over the last year and a half that looked at modifying the A–

10 and modifying the F-16. The conclusion was a new aircraft was much more cost effective.

We need to get much harder design information from the aircraft manufacturers, and that is why we are doing this industry study that I mentioned. I will give you sort of a rough idea what kind of airplane they were talking about.

This airplane was under 20,000 pounds gross weight, a relatively small airplane. It had a low vulnerable area. It would be designed from the ground up to have a very low vulnerable area, like the A-10.

It would have a two field or view FLIR, inertial navigation system, an automatic target handoff system, so that it could communicate with the ground rapidly, and a laser search and track set, and have a gun system as well as either a hypervelocity missile system or some derivative of Hellfire.

It would have a penetration speed up to about 500 knots, as opposed to the A-10, which is about 300 knots. It would have a sustained maneuver capability of about 5gs, as opposed to the A-10 of about 3gs.

It would have a turn instant or a sustained turn capability of about 20 degrees per second, as opposed to an A-10 or F-16, which is like 14 degrees a second. It would have low RCS, but they would not spend a lot of money on the radar cross-section, because that is much more important in battlefield interdiction and deep interdiction, but not so important in close air support.

What is important, I think, is low infrared signature because of the man-portable IR missiles threat. You have to really worry about that.

It would have STOL capability to operate on 1,000 to 2,000 foot runways. Of course, if we can get a VSTOL capability shorter than that, that would be all to the good.

And it would be easy to repair.

Those are some of the highlights of their results, and this is one of the things that led us to feel that we need to go out to industry and see what they have to offer. We had, from time to time, industry teams with their own money working on new close air support concepts, not only U.S. teams but British teams. They had some very interesting ideas for a low cost, highly maneuverable aircraft that would survive by jinking and agility, rather than flying through the threat area at very high speeds.

And again, I have some classified material we could talk about on the capability of some of the new man-portable threats, if you desire.

The last thing I would say is we have six aircraft contractors—Boeing, General Dynamics, Lockheed, McDonnell Douglas, Northrop, and Rockwell—all working this problem. Their emphasis is on design tradeoffs, cost and performance tradeoffs, so we can understand the penalties associated with different attributes.

Cost is an important parameter in this thing as well. We expect that our plan is to have a report from industry in probably about mid-July. Originally it was March, but because of the delays I think July is probably a more realistic time period.

Analysis of the results will take us through early fall, probably through August. The Air Force has two independent contractors to look at this, plus an in-house capability.

We will probably have, in addition, IDA, the Institute of Defense Analysis, doing a parallel effort for us. Then we hope to be ready to implement whatever decision we come up with for the fiscal year 1990 budget in the fall.

Senator LEVIN. Okay, just a couple of questions before we close.

IMPORTANCE OF CLOSE AIR SUPPORT TO FUTURE COMBAT MISSIONS

Has DOD done analytic studies to show how important close air support is to the success of future combat operations?

Mr. FREDERICKSEN. There have been a number of studies like this in the past. They tend to show that close air support is very important. We probably need to have them updated because of the change in threat. We probably need a rather comprehensive look at this again.

Most of the studies that are done tend to focus on the narrow, rather than looking at the whole battle scene. They tend to look at just a portion of it, and it is probably a good idea to take a more comprehensive look and see what the contribution is of close air support.

I think most of us believe that the contribution could be critical, because it could be applied in situations where our friendly forces are getting overrun and air power could make all the difference in the world whether they are or not. It also could make all the difference in the world in making an attack successful, a counterattack or an attack by friendly forces.

In both of those instances, close air support could be very important.

MUNITIONS

Senator LEVIN. To either you or General Shoffner. Most of our discussion this morning has focused on close air support as it involves aircraft. What are we doing to look at munitions?

Can either one of you brief us on that?

General SHOFFNER. In open session I really do not have a lot to say on munitions, sir. We are scheduled to come and talk to you at greater depth next month. I would prefer to defer discussion to that time if you do not mind.

Senator LEVIN. That is fine.

Do you want to add anything here on that?

Mr. FREDERICKSEN. There are a lot of classified programs that have great potential that General Shoffner is talking about. I would say that you are quite right, we have to bring the weapons along as well as the aircraft.

There are some possible improvements to a GAU-8 type of cannon. Actually, we would probably go to the four barrel version of that now because it would be lighter and take less volume.

There are some ammunition changes you could make to make that caliber more effective, or you could perhaps go to a new caliber, a larger gun.

In the missile area, the hypervelocity missile system, which you are well aware of, has potential of being able to kill multiple targets per pass. This is very attractive for close air support, but it is in early stages of development and has a way to go yet.

Another possibility is using some variant of Hellfire. Hellfire has turned out to be a very successful Army program. It has high lethality against armored vehicles because it has a big warhead, and it is relatively inexpensive. It is down to about, $24,000 a unit.

A variant of that would be very attractive for close air support aircraft. There was an autopilot problem with it for a while that did not allow it to be launched from a high speed aircraft, but with the new digital autopilot, which is near the end of its development phase now and will be incorporated soon, we think we will be able to launch it from high performance aircraft.

I am going to try to convince the Marines to try this as soon as we get some that are available, because the Marines have Hellfire on their helicopters as well. So it would be a natural for them.

Senator LEVIN. Do any of you want to add any comment before we close off here?

[No response.]

We will have some questions for the record. We would appreciate your answering them promptly. We have got a time problem particularly this year. So if you could get us those answers back in early April at the latest, we would appreciate it.

A number of my colleagues who were here, including Senators Dixon, Quayle, and Thurmond, may have questions for the record, and other colleagues may also. I will have questions for the record.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR ALAN DIXON

CLOSE AIR SUPPORT (CAS)

Senator DIXON. General Sullivan, given the importance of close air support to the success of ground combat operations, what must the response time be for aircraft to affect the outcome of a battle?

General SULLIVAN. Our experience shows that in order to affect the outcome of a battle, close air support must respond with bombs on target within 20 minutes of the request.

Senator DIXON. General Shoffner, do you agree with General Sullivan?

General SHOFFNER. Sir, for an immediate CAS request in order to fill an urgent firepower shortfall, the time of 20 minutes stated by General Sullivan is a realistic goal and can be met by a divert from a preplanned USAF mission, or from ground or air alert. However, CAS is normally preplanned as launches of fighters into a time window. The sorties are based on a thorough intelligence preparation of the battlefield and the commander's concept of operations. CAS is viewed as a vital element of the combined arms team to mass fires at the proper time and place to implement the ground commander's scheme of maneuver.

CLOSE AIR SUPPORT RESPONSE TIME

Senator DIXON. General Logan, do you agree with General Sullivan?

General LOGAN. While the Air Force cannot speak for the Marine Corps or the Army in terms of military judgement relative to ground combat operations, as a partner in AirLand Battle we can offer several perspectives on the issue. For preplanned requests, close air support (CAS) tasked aircraft must arrive at their designated time-on-target (TOT) to be effective. An early or late arrival for preplanned CAS must be recoordinated with the ground maneuver commander.

Response time for unplanned CAS requests should be addressed at the tactical level and also from the perspective of a theater campaign. Assuming an immediate request is approved by a Corps from its allocated CAS assets, response in most tacti-

cal scenarios should occur within 20 minutes. CAS will often be immediately available in some situations.

Beyond the level of one CAS aircraft responding to one mission against one tactical target, responsiveness is just as critical at the theater level of operations. From this broader perspective, responsiveness is measured in terms of a massive shift of CAS assets from one theater priority to another, or as a reapportionment of air assets from another mission (i.e., interdiction) into CAS. This would occur as a result of decisions by the Joint Force Commander in consultation with the Air Component Commander and the Land Component Commander. Therefore, during theater campaigns "responsiveness" above the tactical level may be measured in terms of hours or a full day.

Senator DIXON. General Sullivan, how well does the AV-8B meet the Marine Corps' requirements for close air support?

General SULLIVAN. After 15 years of experience with VSTOL utilizing the AV-8A, the AV-8B was designed, built, and fielded specifically to meet the Marine Corps' requirements for close air support. It is a simple, reliable, yet powerful aircraft which can generate high sortie rates when operating from austere bases. The AV-8B can be deployed from CONUS directly into the Amphibious Operations Area (AOA) or it can be forward deployed aboard amphibious ships. We can employ the aircraft from amphibious ships, small airfields, roadways, or even grass fields, none of which are available to conventional fixed-wing aircraft. Wherever we establish a support system for our helicopters there exists the beginning of an AV-8B support structure.

The AV-8B can deliver the full spectrum of conventional ordnance for close air support to include the use of the capable 25MM General Electric gun which is effective against a wide range of targets. The angle rate bombing system (ARBS), when combined with the inertial navigation system and weapon system computer gives the AV-8B a reliable, accurate, and totally passive ordnance delivery system. The ARBS doubles as a laser spot tracker for employment of laser guided munitions or delivery of conventional ordnance on a target which is illuminated by a laser spot.

Commencing with fiscal year 1988, all AV-8B procured by the Marine Corps will be configured with a suite of enhancements for employment at night. This night attack variant will have a digital moving map display, a forward looking infrared (FLIR), and lighting that is compatible with night vision devices. The night attack AV-8B will be the Navy's first fielded production aircraft with the capability.

CLOSE AIR SUPPORT AS TOTAL SYSTEM

Senator DIXON. General Sullivan, General Logan in his statement says "the CAS must be viewed as a total system that is not bound to a particular airframe." He also states that the aircraft must be capable of surviving the threat, lethal enough to attack a broad range of targets, and flexible enough to perform close air support and battlefield air interdiction.

Do you agree with this assessment?

General SULLIVAN. Support for Marines engaged in combat cannot be viewed as bound to a particular airframe. We traditionally employ a variety of supporting arms either sequentially or simultaneously. We provide close air support in the same way, with a variety of platforms. The AH-1 carries small payloads short distances but can be placed in direct support of the infantry commander for employment. The A-6 is the Navy's only true all-weather ordnance delivery aircraft and is ideally suited for interdiction, but it requires a conventional airfield to operate and historically does not generate large numbers of sorties. The Corps' extremely capable frontline F/A-18 fighter is also an effective close air support platform which again requires a conventional airfield and sizable support package. The AV-8B's basing flexibility allows it to be employed close to the infantry commander to respond to the bulk of the close air support requests, and its range, payload, and weapons systems make it an effective platform for employment in the deep air support mission.

CLOSE AIR SUPPORT AIRCRAFT REQUIREMENTS

Senator DIXON. General Logan, does the Air Force presently have an aircraft that satisfies all aspects of the ground combat commander's close air support requirements to include response time, basing flexibility, weapons delivery accuracy, weapons payload, and combat radius?

General LOGAN. Yes, the A-10 meets all current CAS requirements but will be unable to do so in the mid 1990s because of improving threats and the increasing demand of AirLand Battle.

CLOSE AIR SUPPORT TECHNICAL CHARACTERISTICS

Senator DIXON. General Logan, your statement indicates that the technical characteristics the Air Force is looking for in a close air support aircraft must include ". . . the ability to operate at night and under the weather with high sortie rates, it must be able to accurately locate and identify the target, it needs a high degree of lethality including the ability to carry a wide array of ordnance and to deliver it accurately, and it must be able to survive against the full spectrum of enemy air defenses." Does the F-16 meet these requirements? Can it be cost effectively modified to meet these requirements in the future?

General LOGAN. My statement only abbreviates the technical characteristics more fully explained in the Army and Air Force Mission Requirements Package (MRP) prepared for the OSD-directed CAS study which may eventually be modified into a formal requirement called a Statement of Operational Need (SON). The F-16, as currently configured, does not meet all the system characteristics specified in the MRP. By the same token, neither does any other aircraft in the current U.S. inventory—including the AV-8B. The F-16 can be modified to meet the MRP's technical characteristics in a cost effective and timely manner.

CLOSE AIR SUPPORT

Senator DIXON. General Sullivan, General Logan's statement indicates that the technical characteristics the Air Force is looking for in a close air support must include, "The ability to operate at night and under the weather with high sortie rates, it must be able to accurately locate and identify the target, it needs a high degree of lethality including the ability to carry a wide array of ordnance and to deliver it accurately, and it must be able to survive against the full spectrum of enemy air defenses." Does the AV-8B meet these requirements?

General SULLIVAN. I believe that General Logan is referring to the specifications as they are currently written for the Air Force's close air support aircraft. I agree with General Logan that, as currently written, there are no aircraft currently in the U.S. inventory that would meet all of those requirements. The requirement specifies a radar which the F/A-18 and the F-16 do have but the AV-8B doesn't. The requirement may not be too stringent in the area of basing flexibility which we feel to be a necessary characteristic for our primary close air support aircraft.

Senator DIXON. Mr. Fredericksen, do you think the F-16 can meet the requirements that I have just quoted?

Mr. FREDERICKSEN. The F-16 was not designed optimally for close air support. The F-16 is a high performance fighter. It is not built to fly low and slow and look for targets. Its maneuverability is not as good as an aircraft should be if it were designed specifically for close air support. The F-16 is a relatively soft airplane with a vulnerable area, against machine guns up through 23 millimeter, higher than it should have for doing close air support.

CLOSE AIR SUPPORT MISSION RESPONSIBILITY

Senator DIXON. General Logan, your statement says that the air component should be responsible for planning and executive operational missions, instead of servicing targets at the tactical level. Yet the Marines feel that the CAS missions are the responsibility and prerogative of the ground combat element commander. Don't you think that this position of the Air Force makes one wonder if you are really interested in flying CAS missions?

General LOGAN. You quote my statement out of context. It is contained in a long discussion about the inter-relationships between CAS and BAI. The thrust was that future BAI needs to be planned and executed under a concept called "mission type orders." This was promulgated by the current SACEUR, General Galvin, and is contained in Army-Air Force operational procedures for joint attack of the second echelon. It is obvious that operational level target arrays demanding the priorities of CAS will be simultaneously targeted with BAI. My emphasis was that to achieve a synergy between these two missions, the CAS that occurs must be integrated into a complex, ongoing BAI effort being conducted under "mission type order." This integration, the example, would share the same battlefield intelligence, SEAD, and local defensive counterair efforts. We must also deconflict Air Force deep CAS and BAI from Army fires occurring beyond the fire support coordination line. I made no inferences to the prerogatives of the tactical ground commander. He rightfully retains ultimate responsibility for CAS sortie requests and execution. The point being, however, the CAS is extremely complex and this sortie execution cannot occur in a tactical or operational vaccum.

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As to your theoretical question posed at the end, I reiterate my previous testimony. The Air Force is professionally dedicated to supporting CAS and other joint warfighting missions. Critics of Air Force CAS would probably misinterpret my statement because the "not invented here" syndrome knows no boundaries. The Air Force position on CAS stands on its own merits. It has evolved through history and has been tested in battle. CAS is a complete interlocking system, and no part should be interpreted in total isolation.

AV-8B

Senator DIXION. General Shoffner, your statement indicates the same requirements for a CAS airplane as General Logan. Do you believe that the AV-8B meets your requirements?

General SHOFFNER. Sir, the Marine Corps appears satisfied with the AV-8B; however, the Army has not evaluated the performance of the AV-8B and cannot comment on the extent to which it would meet our requirements. I am told that the AV-8B will be studied as an option within the CASMARG process. Having stated our battlefield requirements in that context, I am confident that its suitability to meet our requirements will be fully addressed.

CLOSE AIR SUPPORT AIRCRAFT SPECIFICATIONS AND CHOICE

Senator DIXON. General Shoffner, in your statement you say, "The Army's focus is on what close air support must deliver, rather than on the platform from which it is delivered." Based on this statement, do I understand that the Army is not involved in helping draft the specifications for the close air support plane nor will the Army be in on the decision to choose the airplane which is to support your ground operations?

General SHOFFNER. No, sir. The Army is very much involved in the current process of selecting a follow-on CAS aircraft. The Army has been and is involved in this process through the joint initiatives program, joint agreements and, most recently through Army participation in the CASMARG. The Army focus in CAS has never been on the selection of a specific fixed wing aircraft, but upon the close air support system as an element within the combined arms team to rapidly concentrate combat power at the critical time and place. Numerous joint efforts based on experience have produced improvements in the CAS system, in the areas of target acquisition, munitions, communications and control. The current issue is the fixed-wing platform and the Air Force is trained, equipped and experienced in that type of aircraft. One basis for drafting specifications for that platform is the Army's requirements, and those requirements have been provided. In addition, the Army provided mission scenarios and threat analysis, and is involved in discussing battlefield requirements with the selected aircraft manufacturers. If we progress into system development, the Army will provide a position for the new system prior to program initiation and will coordinate on the Air Force Statement Of Need and System Operational Concept.

AIR FORCE INTENT ON CLOSE AIR SUPPORT

Senator DIXON. General Shoffner, the former Undersecretary of the Army, Mr. James Ambrose, was quoted in the Defense News last November as saying that ". . . he has yet to see any real support for buying a replacement for the A-10 Thunderbolt, despite promises that the issue will be studied." He then went on to say there is no money for the replacement in "present or future funding lines." This same article quotes Air Force Undersecretary James McGovern that "the service is not interested in buying a new airplane for close air support in this budget environment." He is further quoted as saying "I think we clearly have an aircraft on our inventory now that can be modified to meet that mission requirement." General, do you really believe that the Air Force is serious about the close air support mission?

General SHOFFNER. Yes, sir, because the Air Force's investment in the CAS system goes far beyond the current airframe issue to ensure that the Army gets effective and responsive CAS. As examples, in joint training in fiscal year 1987, over 3,200 Air Force TACAIR sorties were flown in support of home station training in CONUS. That doesn't include support to Europe and Korea. 200 sorties alone were flown on Joint Air Attack Team (JAAT) training, utilizing Army attack helicopters to suppress air defense and direct CAS. This training includes meeting air-ground requirements at our National Training Center. We are working JAAT Airspace Command and Control, Rear Area CAS, and Joint Procedures for Attack of the Second Eche-

lon; and developing doctrine, tactics, techniques and procedures to fully integrate air/ground operations. We now have Air Liaison Officer (ALO) support dedicated to ground units. We see continuing buys of improved Maverick and 30mm ammunition and we see the enhancement to the A-10 and A-7—increased ECCM capability, an inertial navigation system, and a laser seeker compatible with Army designators—as ample evidence that the Air Force is serious about the close air support mission.

The solutions for meeting the future needs of the Army for CAS have been integrated into the Joint Force Development Program and the Close Air Support Mission Area Review Group process. We are going through those processes now. Within the last few months, the Army has submitted to the Air Force its requirements for CAS for the mid-1990s. The Air Force is serious in meeting these requirements and we are confident that the future CAS system will be compatible with our warfighting needs.

ARMY OWNED CLOSE AIR SUPPORT AIRCRAFT

Senator DIXON. General Shoffner, given the best of all worlds, if Congress gave you the facilities, equipment, people and funding, would it not be better for the Army if it owned its own close air support aircraft and let the Air Force just concentrate on the air interdiction requirements?

General SHOFFNER. Sir, fixed-wing CAS provides to our combined arms commanders with capabilities such as speed, a combat mission radius of more than 250 nautical miles, and the flexibility of different types of multiple kill munition systems tailored to meet the threat. This is not duplicative, but complimentary to Army systems such as artillery and attack helicopters. The Army needs and expects logistical air support, reconnaissance, local air superiority, and air interdiction as well as fixed-wing CAS from the Air Force and within fiscal constraints, they provide it. We are committed to joint and combined operations to achieve unified action on the battlefield.

Given the best of all worlds, both services would want more fixed-wing CAS, but based on our joint experience, our current capabilities, funding, and force structure limitations, and our future near-term view of the battlefield, there is nothing to indicate the Army could actually supply fixed-wing CAS any better than the Air Force. Fixed-wing CAS is, and has been, an Air Force responsibility and the Air Force is dedicated, trained, organized and equipped to provide it. As long as fixed-wing CAS remains viable, it should stand as is.

AV-8B

Senator DIXON. Mr. Fredericksen, it seems to me that the Air Force has that "not invented here" attitude toward the AV-8B plus they really don't like the close air support mission. Yet we have a plane that is being produced today that meets all of the requirements of the Marine Corps for close air support, and we have the Air Force trying to take a good fighter, the F-16, and make it a poor close air support platform.

Do you think that this decision to find a replacement for the A-10 should be taken completely out of the hands of the Air Force and be made by the Secretary of Defense?

Mr. FREDERICKSEN. OSD routinely reviews acquisition strategies put forward by the services and approves, disapproves or modifies them as appropriate. In light of that, I see no need at this time to visit this issue when we in fact are still trying to determine what the best solution is to satisfy the close air support mission.

Senator DIXON. Should Congress take some of the $12 billion being spent by the Air Force to develop a new fighter and direct the Air Force to begin buying a close air support plane?

Mr. FREDERICKSEN. No, we should not do that. We have to find the resources, and I think we can, at the proper time, for a new CAS aircraft should we make a decision to go that way.

CLOSE AIR SUPPORT VULNERABILITY AND SURVIVABILITY OF AIRCRAFT

Senator DIXON. There has been a lot of discussion regarding the vulnerability and survivability of aircraft involved in CAS. I would be very interested in hearing from each of our witnesses what factors help determine the vulnerability and survivability of an aircraft operating in a CAS environment.

Mr. FREDERICKSEN. There are two aspects of survivability. One is threat avoidance or not getting hit; the other is threat tolerance, that is, tolerating a hit and returning to base if it is hit. Some of the key characteristics of an aircraft which help not

getting hit in a CAS environment are high maneuverability, ability to sustain speed while maneuvering, rapid acceleration and deceleration capability, small size, ability to find, identify and attack targets, high first kill capability and high ingress and egress speed. Important factors which determine the vulnerability of an aircraft are its degree of hardening protection, placement of key subsystems, component separation, redundancy of critical flight controls and structure, fire/explosion suppression capability and judicial application of armor.

General SULLIVAN. A raft of material is available that defines survivability, susceptibility, and vulnerability in terms of aircraft analysis and design. Survivability is the ability of an aircraft to avoid and/or withstand hits from threat systems. Susceptibility is the likelihood of an aircraft being hit by hostile fire, while vulnerability implies characteristics that result in damage when an aircraft is hit by hostile fire. A fast, small, maneuverable aircraft protected by electronic warfare systems, and employing standoff weapons and proper tactics, has good susceptibility characteristics. A multi-engined, heavily armored aircraft which has multi-layered redundancy in every system would be relatively invulnerable. Designing aircraft is always a process of finding the best mix of compromises and survivability characteristics are no different.

General SHOFFNER. We expect the CAS environment of the mid-to-high-intensity AirLand Battlefield to be highly lethal and to encompass greater spatial dimensions than previous battlefields. Potential enemies can be expected to field weapons whose range and lethality equal or exceed our own. The operational tempo will be high, with around-the-clock combined arms operations. The threat will be concentrated and controlled by advanced C³I systems. Soviet style echelonment of forces will be the principal means to achieve mass and maintain momentum. Lethal air defense will be infused within the combined arms combat formations and throughout the depths of the battlefield. Increased lethality requires that CAS airframes be capable of operating and surviving in the dense air defense environment at the FLOT and be capable of traversing lethal air defense systems enroute.

General LOGAN. My answer must be framed in terms of the 1990s battlefield since we are examining a follow-on A–10 requirement. Because a CAS aircraft must support rear, close, and deep operations on the non-linear battlefield, its primary vulnerability factor is to radar directed anti-aircraft artillery (AAA), IR/radar guided surface-to-air missiles (SAMs), and all aspect, look-down, shoot-down fighters. Small arms and automatic weapons, while numerous, can be negated to a great extent by surprise, multi-kill per pass weapons, and short-range stand off tactics. Hardening of some critical components and inert gas systems can help against small arms, but is essentially useless against a 50 lb class expanding-rod warhead.

Thus a CAS aircraft has to avoid hits rather than absorb hits. Survivability essentially depends on its speed and maneuverability coupled with situation awareness via a radar warning receiver and on-board radar. Electronic counter measures and other expendables are vital to increasing miss distance. Exposure time must also be limited by weapons, tactics, and target cueing devices.

Senator LEVIN. If you have classified charts, we would like to see them, if you could provide them to us so that we could have a look at them if we have not received those before.

And if there is nothing further that any of you have to add, we will stand adjourned. Thank you very much.

[Whereupon, at 11:40 a.m., the subcommittee was adjourned.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1989

WEDNESDAY, APRIL 13, 1988

U.S. SENATE,
SUBCOMMITTEE ON CONVENTIONAL FORCES
AND ALLIANCE DEFENSE,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

ARMOR/ANTI-ARMOR PROGRAMS

The committee met in open session, pursuant to notice, at 2:08 p.m., in room SR-222, Russell Senate Office Building, Senator Carl Levin (chairman) presiding.

Present: Senators Levin, Dixon, Wirth, Shelby, Thurmond, Cohen, and Quayle.

Staff present: Carl M. Smith, staff director for the minority; Romie L. Brownlee, deputy staff director for the minority; Marie Fabrizio Dickinson, assistant chief clerk, and Kathyrn E. Bognovitz, special assistant; Richard D. Finn, Jr., John J. Hamre, George K. Johnson, Jr., Mark B. Robinson, and Daniel J. Wildfong; professional staff members; Tiffany E. Berger and Cindy Pearson, staff assistants.

Also present: Charles C. Smith, assistant to Senator Dixon; Milton D. Beach, assistant to Senator Glenn; Robert K. Griffith, assistant to Senator Wirth; Terrence M. Lynch, assistant to Senator Shelby; Henry D. Sokolski, assistant to Senator Quayle; and Anthony H. Cordesman, assistant to Senator McCain.

OPENING STATEMENT OF SENATOR CARL LEVIN, CHAIRMAN

Senator LEVIN. The Conventional Forces Subcommittee will come to order. We welcome everybody here this afternoon. We are going to be interrupted in a few minutes, probably about the time I finish my statement. I think we have a vote at 2:15 p.m.

This afternoon the Conventional Forces and Alliance Defense Subcommittee meets to receive testimony on one of the most important problems that we face in the area of conventional forces; that is, the armor/anti-armor balance in Europe between NATO and the Warsaw Pact.

In recent years the Soviet Union has been fielding tanks and anti-tank systems of increasing quality. In light of this disturbing trend, the Defense Science Board convened a special study group to study the armor/anti-armor problem. The conclusions of that study were very disturbing.

Not only has the Soviet Union narrowed the quality gap in this key area, but in some instances they are fielding systems of greater capability than U.S. systems.

Three years have passed since the Defense Science Board conducted that study. Frankly, the progress toward reversing the adverse trends has been poor. For too long the Army did not proceed vigorously, interpreting the Defense Science Board study as a critique rather than a constructive net assessment. I am pleased to report that I think the Army has now made this one of its highest priorities, but the hour is late.

We are now on the edge of ratification of the INF Treaty. The treaty places greater emphasis on credible conventional defenses, but this comes at a time when the quality of some of those conventional forces, specifically in the area of tanks and anti-tank systems, is inadequate.

The M1 tank is the best tank in the world, but the pace of Soviet developments does not permit us to rest on past accomplishments.

To deal with these key questions and issues, we have a distinguished set of witnesses today. Gen. Donn Starry retired from the U.S. Army 5 years ago. General Starry had extensive experience in the area of modern armor warfare and was asked to co-chair the Defense Science Board study group that examined the armor/anti-armor balance.

We have asked General Starry to summarize generally the findings of the Defense Science Board study and to evaluate whether those conclusions remain valid 3 years after the study was concluded.

Following General Starry's testimony we will hear from Lt. Gen. Donald Pihl, the Military Deputy to the Assistant Secretary of the Army for Research, Development, and Acquisition, and from Maj. Gen. W.A. Shoffner, the Assistant Deputy Chief of Staff for Operations and Plans with specific responsibilities for force development and integration.

General Shoffner has recently supervised a new net assessment of the armor/anti-armor balance and will brief the committee on the results of that study.

General Pihl will provide an overview of the Army's new armor master plan.

This hearing will be held in open session so long as security procedures permit, but let me inform everybody in attendance that at some point in the hearing we must go into executive session, and we will have to clear the room at that time.

General Starry, let me call on you.

STATEMENT OF GEN. DONN A. STARRY, USA, RET., FORMER VICE CHAIRMAN, DEFENSE SCIENCE BOARD STUDY ON ARMOR/ ANTI-ARMOR

General STARRY. Thank you, Mr. Chairman. A prepared text has been submitted for insertion in the record and, as is the will of the chairman, I will do my best to summarize that.

Senator LEVIN. We appreciate that, and the entire statement will be made part of the record.

General STARRY. I have been asked to summarize the outcome of the assessment of the status of the armor/anti-armor competition between the United States and the USSR conducted by a 1985 Defense Science Board task force of which I was chairman and to say what, if anything, has happened or changed, really, as a result of the threat to technology or our own program developments since that time.

The principal finding of that 1985 study was that we were probably behind the Soviet Union, had been for some time, and getting further behind at what we described as an alarming rate. When we reported to the Secretary of Defense in August of that year, we described the situation as serious and one approaching a matter of some national urgency. Today, it is my judgment that we have crossed that threshold. The situation is now a matter of considerable national urgency. Indeed, I would describe it as critical.

The task force findings which led to the original conclusion and the subsequent events which cause me to turn up the level of urgency can be summarized briefly as follows.

First, let me describe the threat. To do that, with your permission I will use a chart which reflects what is known about the Soviet acquisition process on a scale here which does not really have any numbers.

THE BATHTUB OF IGNORANCE
WHAT IS KNOWN ABOUT SOVIET RDA SYSTEM

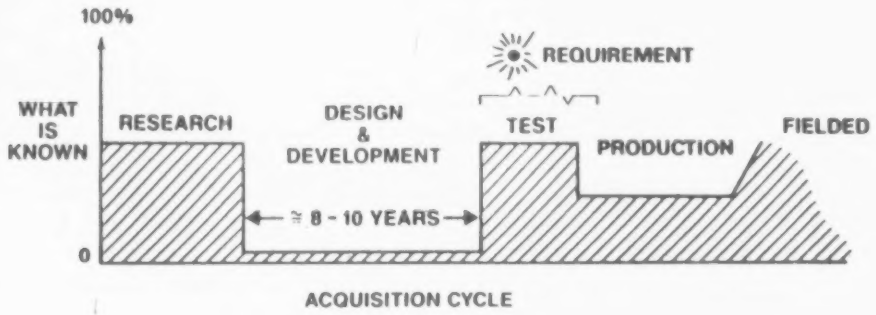


CHART 1

SOVIET RESEARCH AND DEVELOPMENT CYCLE

A great deal is known about what is going on in research and development in the Soviet Union. They publish just as we do. Scientists have a penchant for not being able to keep secrets, so in the open literature there is a great deal of information flowing; but that disappears for a period of time or tends to disappear for a period of time, and we tend to say on our side, "aha, they have given up on that."

Well, that may or may not be true. They may have given up. They also may have gone to full scale engineering development

with whatever the technology was. So it disappears for a period of time only to reappear some years later as a fielded system, in some cases systems being issued to troops in the field as opposed to a system running around a test track. We take a picture of that from the overhead sensors, and all of a sudden we have an 8 by 10 inch glossy print which says, here is what they have done with that technology.

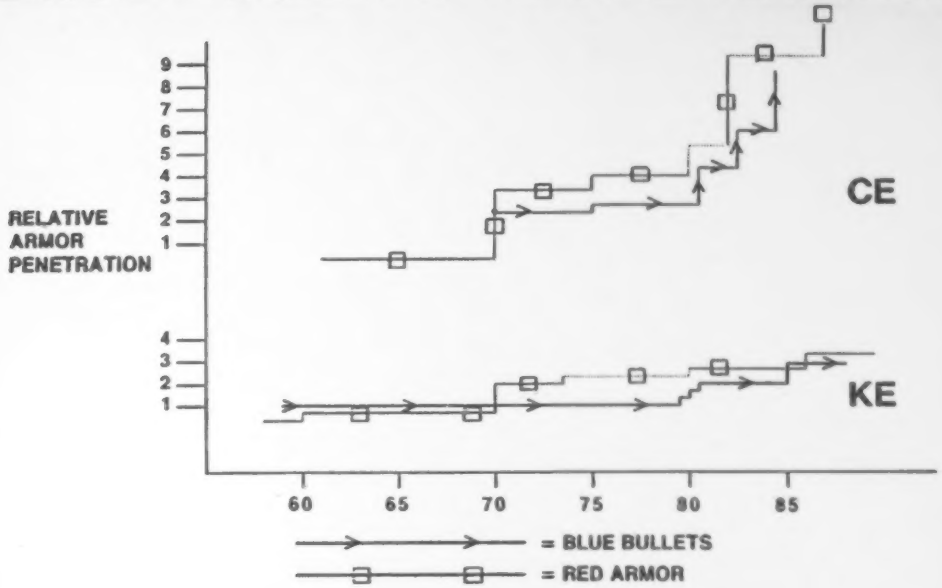
That period of time is what we would call in our system, full scale engineering development, and it turns out to be on the average of about 8 to 10 years in length; therefore, if you do not respond to see the finished article and it takes you 4 or 5 years to catch up with that fielded article, you may be as much as 10 or 15 years behind and not just 5 years behind as your own system catch-up would allow. That is a basic problem.

I am not criticizing our intelligence system. As a matter of fact, it turns out there is a good deal of information. Even though relatively less, there is a good deal of information about what is going on in this development period. What is at fault is our ability and willingness to make decisions based on intelligence projections out of that piece of the acquisition cycle. Because of the shape of this curve (indicating), we call that the bathtub of ignorance. I will refer to it as the bathtub as we go along, and I will describe later on for you what we thought in August of 1985 was in the bathtub compared to what we have going on in our own full scale engineering and development cycle. We can do this in closed session.

The second problem that we surfaced is a question of our ability or inability to field modern technology in a timely way. Out of some 30 technology developments the task force examined, we found at least a dozen which had been funded at the entry levels of development, 6.1 and 6.2, for 12 to 15 years.

This situation illustrates the fact that while we may be ahead of the Soviets technically, more and more of that advantage is on the laboratory bench. We have a tendency to say a few more dollars and a little more time and we will give you something that much greater. A few more dollars turns into millions and billions, a little more time into months and years, and the delta in performance is not always that great. May I just illustrate that by using a couple of charts to compare red bullets and blue armor, blue bullets and red armor. First, the blue bullets and the red armor.

BLUE BULLETS VS RED ARMOR



U.S. VERSUS SOVIET ARMOR

The vertical scale here is simply relative armor penetration. On the top of the chart is the chemical energy. These are the warheads of the anti-tank guided missiles. Along the bottom of the chart are the kinetic energy penetrators out of the hypervelocity rounds and the tank guns.

If you look at blue bullets for a moment, these names associated with these lines here are like TOW and improved TOW, the names of our existing systems.

As you can see, when we field, even when we fielded a TOW for the first time, about 1970, it was almost immediately overmatched by armor on the Soviet tanks. This is the period in which the Soviets began to field either class inserts or laminate armors of some kind, composite laminates later on. So we have always been behind.

After the Yom Kippur war in 1973, we started some programs to catch up. As you can see here, our catch-up attempt was going on at the same time they were improving their systems. So by the time our catch-up systems were fielded, we find ourselves faced with a threat that overmatched the catch-up.

The same thing is true in kinetic energy. These are blue bullets, and we kept the same penetrator and the M68 105 millimeter tank cannon for about 19 years. These little stairsteps here are the improvements that resulted from the program undertaken after our evaluation of the Yom Kippur war. As you can see, the same phenomenon repeats itself. We caught up, but we did not catch up far enough.

Two things come out of this evaluation, and you will see it again in the next set of charts. One is that every time we try to catch up, we do not catch up far enough, so that by the time we field our

catch-up systems the other side has done something else to his system which overmatches the catch-up system.

The second thing is we do not establish or have not yet been able to establish a modernization rate that is at least as good or better than that of the other side. So we are falling behind at a rate that we described in the report as alarming.

RED BULLETS VS BLUE ARMOR

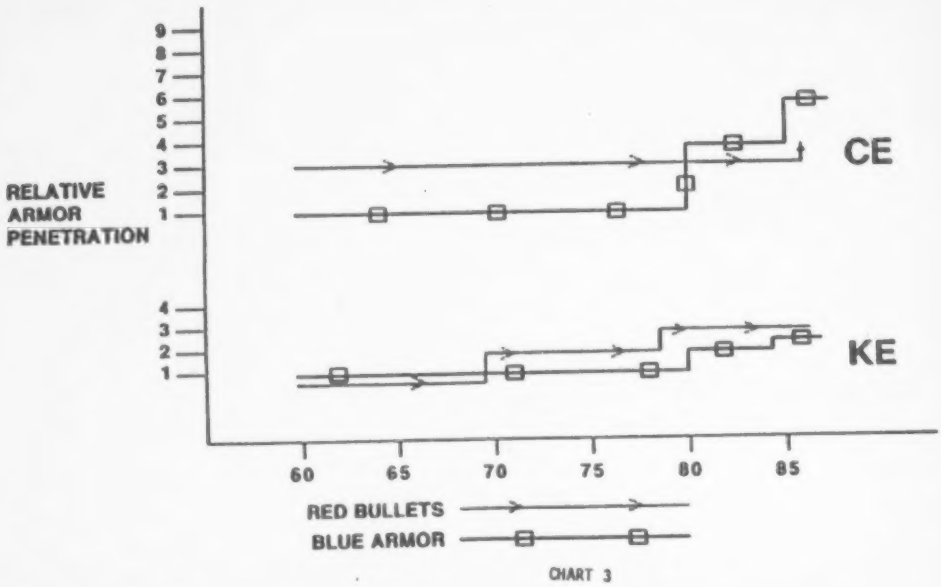


CHART 3

The next slide is the reverse side of that same coin, red bullets now and blue armor. This red bullet is the Soviet anti-tank guided missile, and I have to admit that we are not sure what happens to it out here (indicating) because surely if they are working on armor that is as good as what they have in the field today, they are working on defeat mechanisms for that armor. We just do not know what they have done or how good it is yet.

In any event, it overmatched our own tank armor for some years until we fielded the M–1.

On the bottom again with kinetic energy, red bullets were about a match though not quite a match for the armor on the M60 tank. Then with the advent of the 125 millimeter guns on the late model T64 and T72 Soviet tanks, we have been vulnerable since that time.

The end result of this is that every year, for example, the Soviets modernize a force about the size of the total U.S. Army and Marine Corps heavy forces combined. Every 2 years they modernize a force about the size of the total NATO heavy force combined. Now, obviously the scale is different. Their forces are much larger than ours, but just on a basis of numbers the output of the factories provide that kind of improvement in their forces; hence, the conclusion that we are behind and getting further behind at an alarming rate.

MANAGEMENT INITIATIVES

The study examined and made several recommendations with regard to management and what we call management initiatives. I will not detail those except to give three highlights. One is we recommended that the existing armament improvement programs which General Pihl and General Shoffner will address themselves to as we go on here be reexamined to make sure they, first of all, overmatch the threat that is expected at the time of their fielding; and second, that in proceeding out into the future with those improvements the rate of modernization that we build into the systems development has to be at least equal to and hopefully better than that on the other side.

The second recommendation had to do with designing and building a family of close combat vehicles which resulted in a task force which is under way and has been for several years. Generals Pihl and Shoffner can report to the committee on that.

And, third, we reviewed the doctrine for the battle given the differential in fielded technology, and we suggested that we look at ways of expanding the close battle space, that is, the battle at the forward line of troops, using modern technology particularly in the form of electromagnetic launch systems and hypervelocity missiles in order to overcome Soviet developments in anti-tank guided missile defenses which give them greater protection than they ever had before and so close in on the battle space that we had expanded with those systems in the early 1970s when we first fielded the TOW. The Army will report on programs and status of programs. Considerable work has begun, but the fact is that little, if any, progress has been made in redressing the imbalance in fielded systems. In fact, with regard to fielded systems the situation has worsened in the last 3 years and not gotten better.

ASSESSMENT OF THE THREAT AND TECHNOLOGY

In order to understand this assertion and from whence it derives, it is necessary to review briefly the widening gap in capabilities to the Soviet advantage quantitatively for certain and in increasing circumstances, as the chairman pointed out in the beginning, qualitatively as well. In other words, to answer the questions of what has changed in threat and technology since the 1985 assessment, we need to look at the long-term trends in the Soviet system.

Since about 1966 when they believed they had achieved nuclear parity, they embraced the notion that they could and should try to win at the theater level of war at least in central Europe without the use of nuclear weapons if at all possible. So they began a series of 5-year programs designed to improve their conventional force capability.

To fill the gaps in their conventional capabilities early on, they used nuclear weapons such as the nuclear warheads on the ballistic missiles that they fielded at theater level, but over time you saw them replace those nuclear warheads with conventional warheads as the missile systems became more accurate and the conventional warheads became more effective. You see some other changes in their fixed wing air power and changes in their force structure

such as the operational maneuver groups and the Spetznaz forces, the special forces organizations.

The missing link in their conventional equation for years has been in the armor/anti-armor equation, for with the deployment and the proliferation of anti-tank guided missiles in the West in the early 1970s, the Soviet ability to breakthrough NATO's anti-tank defenses without losing a lot of Soviet tanks in the process was uncertain at best and doubtful at worst. So at that point they set about to solve the technical riddle of the shape charge warheads on all of the world's anti-tank guided missiles, TOW in this country, HOT and MILAN in Europe, SAGGER in the Soviet system.

Not only were those warheads about twice as effective for armor penetration as their counterpart high velocity kinetic energy penetrators from tank guns, but the long-range accuracy of the anti-tank guided missile systems nearly doubled the effective engagement ranges that you could get with tank guns. So with the range doubled, you had quadrupled space out there, area being a function of the square of the range, of course.

Senator LEVIN. General, I am going to have to interrupt you. I am afraid I have to run to vote, and we will just take a brief recess of perhaps 5 to 10 minutes.

[A brief recess was taken.]

Senator LEVIN. General Starry, we interrupted you right in the middle of your testimony, but while we are interrupting you let me ask my colleagues if either of them might have an opening statement of any kind.

Senator Shelby, do you have an opening statement?

Senator SHELBY. I have none, Mr. Chairman.

Senator LEVIN. Thank you. I do have a prepared statement from Senator Dixon that will be entered here.

PREPARED STATEMENT BY SENATOR ALAN J. DIXON

Mr. Chairman, the hearings today focus on the critical issue of the United States and our allies' conventional defense capabilities. By almost all measures, the United States and our NATO allies lag behind the Soviet Union and the Warsaw Pact in armor and anti-armor warfighting abilities. Our numerical inferiority poses a grave threat to our national security.

With the ratification of the INF Treaty all but an accomplished fact, we must look ahead to correcting the serious imbalance in conventional weaponry between the East and West. While both NATO and the Warsaw Pact nations have been improving their conventional capabilities in recent years, the East has made more determined progress in increasing numbers of weapon systems and are also updating their quality. NATO must aggressively seek conventional arms control agreements. NATO and the United States must, however, enter these negotiations with coherent and unified defense and arms control strategy and goals, if we are to successfully confront the challenges before us.

Our witnesses today agree that we have major deficiencies and shortfalls in our land defense to overcome. They have laid out the problem and offered some solutions. This committee has in the past, and will in the future, work closely with the Department of Defense and the military services to improve our conventional forces and provide our troops with the best weapons and support available.

I look forward to hearing from our distinguished panel, and I am sure they will contribute to the dialogue on this critical issue.

Thank you, Mr. Chairman.

Senator LEVIN. Please proceed, General.

General STARRY. By the mid-1970s the Soviets had begun to field tanks in the T64B series, featuring their initial response to the problem of how to defend against the anti-tank guided missile shape charge warheads, for the T64B and subsequent armors which were more than a match for the early model anti-tank guided missile warheads.

While the tank fleet with this advanced level of protection was growing apace, technology provided the means for even better protection in the form of what is now popularly called reactive armor.

REACTIVE ARMOR BOXES

Reactive armor in the form of applique boxes, fixtures about 10 by 12 by 4 inches in size containing explosives which detonate on impact, destroying the integrity of the incoming anti-tank guided missile shape charge jet, was first fielded by the Israeli defense force in the late 1970s and early 1980s. It went to war in 1982 in the war for peace in Galilee. Some of it fell into Syrian hands and so into Soviet hands.

Soviet-built models of the same boxes began to appear on tank fleets in the group Soviet forces in Germany just a couple of years ago. In fact, by some estimates the Soviets have equipped more than half of the Soviet tank fleet in group Soviet force Germany, the T64Bs, the T72s and the T80s, with reactive boxes and can quite likely finish that fielding in the next couple of years. The unhappy fact is that tanks with reactive armor on top of the built-in glass composite or ceramic laminate armor will seriously degrade most Western unitary shaped charge warheads.

Senator COHEN. Hellfire, Copperhead?

General STARRY. We are not sure about that, but possibly.

Senator COHEN. But you are less categorical on that, because your statement reads, "all known deployed systems".

General STARRY. Hellfire is in the process of being fielded. That is why that is worded the way it is.

Senator COHEN. And Copperhead?

General STARRY. That is still unknown.

Senator COHEN. And the 120 millimeter depleted uranium round?

General STARRY. That is a different problem. That is the kinetic energy penetrator. With TOW, HOT, and MILAN, you see, we are talking about chemical energy warheads. The long-rod penetrators are a different problem. Do not forget that the Soviet problem was how to defend against the chemical energy warhead, and that is what they set out to try to solve, because it is by and large about two and a half to three times a better penetrator of armor than is the kinetic energy round. So the priority was how to defend against the chemical energy warhead.

Senator COHEN. What about our depleted uranium round?

Senator LEVIN. Could you just hold off for one second, Senator? [Pause.]

Just so long as you are aware, General, we are in open session, you may proceed to answer that as you wish.

Senator COHEN. We can defer that question.

Senator LEVIN. Why not just defer that, because there could be a little delicacy on that one. Let us just hold off on that one.

General STARRY. Thank you, Mr. Chairman. With the advent of the reactive boxes on top of the ceramic or glass composite armors, it appears that the Soviets believed they had the answer to the question of how they could quickly get through the anti-tank defense belts that we built in Europe in the mid-1970s without losing a lot of Soviet tanks. They believed then, I think, that they had the capability of breaking through quickly to strike deep to disrupt NATO's defenses and could do so quickly enough to preempt a nuclear decision in the West.

So now not only are they in the possession of all the capabilities long considered essential for a quick victory in Europe without risking a nuclear exchange, but all this comes to pass at a most opportune time, for it allows them to offer the West the opportunity to apparently defuse theater level nuclear confrontation by taking out the theater level nuclear systems which the Soviets have concluded they do not need anymore themselves but which we, given the conventional force imbalance and the technology situation in regard to armor/anti-armor, need even more perhaps than we did before.

So we have a technology advance at the tactical level of war which has important implications for theater and national level strategies and capabilities as well. It is on that basis that I changed at least my personal assessment of the situation from one approaching national urgency to something that I described in the beginning as critical.

INTERMEDIATE NUCLEAR FORCES (INF) TREATY

Were it not for the strategic situation, the INF Treaty agreement and the growing clamor for arms reductions of all kinds, it might be possible to look on this situation with the reactive boxes as just another one of those technical flip-flops which occurs now and then and which in due course can and will be overtaken, perhaps even reversed.

In this case, however, it seems to me there is much more to it than that for, from the Soviet perspective, eliminating the INF in Europe, coupled with their vastly improved armor/anti-armor capabilities, significantly improves their capability to execute a long and consistently held operational concept, where from our standpoint we are without a theater level nuclear deterrent.

The close battle space in the forward areas has been shrunk to its pre-1970s levels, and we are apparently without a carefully thought-out strategy defining the linkage, if any, between the conventional imbalances at the theater level and our remaining nuclear capabilities. It is on this basis and on the fact that in fielded systems we are not much, if any, better off today than when the task force studied the problem 3 years ago that I have to conclude that we described 3 years ago as a matter of national urgency is now a fullblown matter of urgent national priority.

Thank you.

[The prepared statement of General Starry follows:]

TESTIMONY
BY GENERAL DONN A. STARRY (Retired)
EXECUTIVE VICE PRESIDENT, FORD AEROSPACE

THE ARMOR ANTI-ARMOR COMPETITION
U.S. VS. USSR

Mr. Chairman, I have been asked to summarize the outcome of an assessment of the status of the armor anti-armor competition between the U.S. and the USSR conducted by a 1985 Defense Science Board Task Force of which I was chairman, and to set forth what, if anything, has changed as a result of threat, technology, or our own program developments since that time. As best it can be done in unclassified form, I will attempt to satisfy that requirement in this testimony.

The principal finding of the 1985 Study was that in armor anti-armor systems, the U.S. was probably behind the Soviets, and getting further behind at an alarming rate.

In 1985 the task force considered the problem serious; describing it as one approaching a matter of national urgency. Today it is my judgement that we have crossed the threshold; the situation is now a matter of considerable national urgency!

Task Force findings leading to the original conclusion, and subsequent events which cause me to "turn up the gain" on the level of urgency may be summarized briefly as follows.

Threat development can be characterized by a perspective about the Soviet materiel acquisition process. As indicated on Chart 1, on a relative scale, a good deal is known about what technologies are in research and development on the Soviet side. Scientific journals and other open literature collectively provide a fairly substantial body of data from which we can determine, by inference at least, what they have in R&D.

Moving along in time we find the volume of information in regard to a given technology declining, or even disappearing. On our side there is a tendency to say, "they've given up on that." While that may be the case, it is equally possible that they have moved the technology into what we call full scale engineering development -- a process in their system about which we know far less than we do about the R&D process. Time passes -- as much as eight to ten years. Then, all too frequently, we see from overhead sensors a new weapon system -- in test, or in some cases even, being fielded; a system that fields that "disappeared" technology. Because of the shape of the curve describing

this phenomenon the Task Force chose to call this decline of information during full scale engineering "the Bathtub of Ignorance."

We react — try to catch up. Historically catch up has taken, conservatively, at least five years. Hence, depending on whether or not we are pursuing the same technology, and depending on how far along we may be with our development, we could be as much as fifteen years behind in applying new technology to fielded systems. Historically we more often than not find ourselves about eight to ten years behind.

This is not an indictment of our intelligence system. For despite the presence of relatively less information about what is in the "Bathtub" -- in the Soviet engineering development process, we do have sufficient information on which to base fairly reliable estimates. It is rather our decision making process which is flawed.

Our system tends for the most part to react positively when confronted by hard evidence -- usually photographs of fielded equipment, but negatively to intelligence community projections of what is likely in the "Bathtub" at a given time. Confronted by a fielded system, or an about to be fielded system, a reactive strategy such as ours, foredooms us to a "get behind and stay there" situation.

Another feature of the Soviet acquisition process which demands mention is the volume of what is in engineering development at any given time. At the time of the 1985 Study, major systems in the "Bathtub" outnumbered those in full scale engineering development in our own system by a factor of eight or ten.

Related to the threat situation just described is the history of our ability, or inability, to field modern technology in a timely way. Out of some thirty technology developments examined, the Task Force found at least a dozen which had been funded at entry levels of development, 6.1 - 6.2, for twelve to fifteen years. This situation illustrates the fact that while we may be ahead of the Soviets technically, more and more the advantage is only on the laboratory bench. In fielded systems we display a notorious penchant for, "just a little more time and just a few more dollars and we can have so much more capability." Years and millions (or billions) later we find ourselves with but a marginally better capability than we would have had had we fielded the technology sooner. Like intelligence and the threat, this is not an indictment of our technology. What it does highlight is our inability or unwillingness to make timely decisions in the acquisition process.

May I just illustrate the situation using a comparison of Blue bullets versus Red armor and Red bullets versus Blue armor.

Considering Blue bullets and Red Armor (Chart 2): on relative scales chemical energy, shaped charge, warheads -- warheads on anti-tank guided missiles for example, have historically been better penetrators than kinetic energy, high velocity, gun fired penetrators by a factor of at least two to one. That situation reversed itself in the mid-to-late 1970's when, with the advent of composite, later ceramic laminate armor, and still later of reactive armor, chemical energy penetration became extremely difficult. Today the combination of composite or ceramic armor and reactive appliques has likely made obsolete every fielded system -- especially every fielded antitank guided missile system which uses a shaped charge warhead as a defeat mechanism.

Two additional phenomenon appear from a comparison of Blue Bullets and Red Armor. First we have tried periodically to catch up, only to find that developments on the other side have moved ahead apace, to the end that, once our catch up programs are fielded, we are still behind. Second, despite several attempts to do so, we have never been able to establish a modernization rate equal to, or better than, that of the threat. So we are behind and are getting further behind.

Considering Red Bullets and Blue Armor (Chart 3), we again find that, in fielded systems, we have been overmatched for a long time, and that the situation is not improving. From time to time, we have tried to catch up only to find that developments on the other side have put threat ahead as we finished our "catch up". And here again, we have not been able to establish a modernization rate to match or better that of the threat.

Historically therefore we find ourselves almost always in a catch up mode. By the time we catch up, momentum on the other side has put the threat ahead of us once more. So we hardly ever catch up. Worse yet, we are unable to achieve a modernization rate that can match or better that on the other side. The end result is that the Soviets are out modernizing us at a rate of about four to one. Every year, for example, they modernize a force the size of the total U.S. heavy force; every two years they modernize a force the size of the total NATO heavy force. It need not be spelled out in detail that our modernization rate is dramatically less robust.

Hence, the conclusion that we're behind and getting further behind at an alarming rate.

In addition to threat assessment and our technology posture, the task force reviewed all ongoing armor anti-armor development programs, and as a result returned several findings and recommendations that can be grouped under the general heading of management initiatives. Recommendations included the following:

1. Provide for competition and insure objective evaluation in threat assessment, and in developments to counter the threat. In all too many cases both threat assessment and developments to counter the threat were under the purview of the same laboratory. With judge and jury one in the same, resulting lack of objectivity and competition created obvious inefficiencies and institutional biases that a more objective system would have tended to offset from the beginning.

2. Better utilize industry/DOE resources by creating competing armor anti-armor design and development programs. The purpose here was to bring the considerable technical capability of the National Laboratories more directly to bear on our most critical problems. In some cases these labs were working the critical problems; in all too many they were not.

3. Improve existing databases and analytical tools for industry/DOE application to armor antiarmor research and technology development. Databases were found to be outdated, with only minimal current test and evaluation data and incomplete phenomenology data baselines. In many cases, especially in the Army, the most modern and advanced computing equipment had not been harnessed to tasks requiring large computational workloads.

4. The OSD should establish an advanced armor antiarmor technology research program, designed to provide OSD oversight into and coordination of not only basic armor antiarmor research, but of subsidiary technology programs such as manufacturing technology, VHSIC munitions related programs, and spinoffs from programs, such as SDI, of technology applicable to the armor antiarmor equation -- electromagnetic launch technology for example.

5. Existing armament improvement programs should be reviewed and modified as necessary to prioritize technologies which overmatch threat protection levels expected at the anticipated time of fielding. In addition future armament improvement programs should field systems at a rate which provides a rate of modernization at least equal to the expected rate of improvement in threat systems.

6. OSD, in conjunction with the Services, should develop an Armor AntiArmor Master Plan designed to: (a) catch up with and overmatch the expected threat: and (b) establish and sustain a competitive modernization rate. Provided for should be programmed equipment upgrades in the form of "N-Block" improvement programs.

7. Initiate development of requirements for a family of close combat vehicles — tanks, infantry fighting vehicles, artillery, support vehicles, designed to reduce operating and support costs through component commonality, and to insure optimized protection levels, signature reduction and related measures of combat effectiveness, and deployability.

Finally, a review of current doctrine for the heavy force battle led to a recommendation to initiate programs to expand the close battle space — at the Forward Line of Troops (FLOT), consistent with threat developments, especially those in reactive armor, and with technical opportunities offered by advance technology hypervelocity weapons.

The Army will report on the status of programs set in train as a result of the Task Force recommendations. It is fair to say that, while considerable work has begun to implement Task Force recommendations, little, if any, progress has been made in redressing the imbalance in fielded systems. In fact the situation in regard to fielded systems has worsened in the last three years. In order to understand this assertion and from whence it derives, it is necessary to review the widening gap in capabilities -- to Soviet advantage, quantitatively for certain, and, in increasing circumstances, qualitatively as well. In other words to answer the questions of what has changed in Threat and technology since the 1985 assessment. To answer those two vital questions a perspective narrative on long term trends in the Soviet system is necessary.

Since about 1966 when the Soviets believed they had achieved nuclear "parity" they have embraced the notion that they could and should try to win at theater level, avoiding the use of nuclear weapons if at all possible. At first they filled gaps in their conventional capabilities with nuclear weapons until they could develop the numerical and technical superiority necessary to win quickly at the theater level of war without invoking the nuclear spectre in the process. Their conventional weapons developments in the Five Year Plans, have for twenty five years, been clearly focused on that goal. Perhaps that focus is more clear in hindsight than it was in the threat projections — some say yes, others not so. However, they are now completing the most recent conventional development that will make their non-nuclear theater level winning capability a reality, as they view it.

Over the span of the relevant Five Year Plans we have seen the development and deployment of impressive capabilities in artillery, air defense, radio electronic combat, combat helicopters, ballistic missiles, fixed wing air power, and force structure changes such as OMG and SPETZNAZ. The missing link has been in the armor anti-armor equation. For with deployment and proliferation of antitank guided missiles in the west in the early 1970's, Soviet ability to break through NATO's anti-tank defenses without risking

substantial loss and possible defeat was uncertain at best, doubtful at worst. So they set about to solve the technical riddle of the shape charge warheads used on all the world's ATGM — TOW, HOT, MILAN, even their own SAGGER. Not only were those warheads roughly twice as effective for armor penetration as counterpart high velocity kinetic energy penetrators from tank guns, but the long range accuracy of ATGM systems nearly doubled effective gun engagement ranges and in so doing quadrupled the close-in battle space that would be dominated by well laid down defenses built around integrated combinations of artillery, tank guns and ATGM.

By the mid 1970's the Soviets had begun to field tanks in the T64B series featuring their initial response to the problem of how to defend against the ATGM shape charge warheads. For the T64B and subsequent models — T72, T80 and now what the west calls FST 1 -- future Soviet Tank One, contained lighter weight glass composite or ceramic laminate armors which were more than a match for the early model ATGM warheads. While tank fleets with this advanced level protection were growing apace -- production running three to four thousand units per year, technology provided the means for even better protection in the form of what is popularly called reactive armor. Reactive armor in the form of applique boxes -- fixtures about ten by twelve by four inches in size containing specially designed explosive arrays which detonated on impact, destroying the integrity of the incoming ATGM shape charge jet was first fielded by the Israeli Defense Force in the late seventies and early eighties. It went to war in the 1982 Israeli operation for Peace in Galilee mounted on IDF M60's and other more lightly protected armored vehicles. Some of these boxes fell into Syrian, and so into Soviet hands. Soon, improved models were available in Israel, and within the last two years similar improved boxes have begun to appear on tank fleets in Group Soviet Forces Germany. In fact, by some estimates the Soviets have equipped more than half the Soviet tank fleet in GSFG -- T64B's, T72's, and T80's with reactive boxes, and can likely complete the fielding in the next couple of years.

The unhappy fact is that tanks with reactive armor on top of built-in glass composite or ceramic laminate armor will quite likely defeat the warheads of all deployed ATGM in the world today -- TOW, HOT, MILAN, even SAGGER. While the technology involved is not all that exotic, reactive armor in this form is a very attractive solution to what, for the Soviets, since the early seventies has been a most vexing problem — how to quickly get through the deepening belts of anti-tank guided missile systems deployed forward in NATO without suffering inordinate losses in Soviet tanks. Here then is a relatively uncomplicated, fairly inexpensive solution; one that can be achieved without building a new, or rebuilding an older, tank fleet. Further it is a fairly rapid way to complete development of their conventional capability to break through quickly, strike deep to disrupt the integrity of NATO's defenses and

do so quickly enough to preempt a nuclear decision in the west. So now, not only are they in possession of all the capabilities long considered essential for quick victory in Europe without risking a nuclear exchange, but this all comes to pass at a most opportune time. For it allows them to offer to the West the opportunity to apparently defuse the theater level nuclear confrontation by taking out the theater level nuclear systems which the Soviets have concluded they don't need any more, but which we, given the conventional force imbalance and the technology situation in regard to armor, need even more perhaps than we did before. Thus we have a technology advance at the tactical level of war which has important implications for theater and national level strategies and capabilities as well.

The Soviets obviously believe that they now have the means to execute the operational concept they have embraced for so long -- achieve quick, decisive victory at theater level of war, and do so with such thoroughness and dispatch that the nuclear decision in the West is yet in abeyance even as they consolidate their theater level gains. Why else would they concentrate their resources on rapid application of reactive armor to those particular tank fleets. Why else would they have undertaken the ongoing restationing of divisions in GSFG to put the Soviet divisions equipped with those particular tanks in the assault echelons.

Were it not for the strategic situation, the INF treaty agreement, and the growing clamor not only for additional nuclear arms reductions, but for conventional arms drawdowns as well, it might be possible to look on this as just another of those technological flip flops which occurs now and then, one which in due course can and will be overtaken, perhaps reversed. In this case there's much more to it than that. For from the Soviet perspective, eliminating the INF in Europe coupled with their vastly improved anti-armor capability significantly improves their capability to execute a long and consistently held operational concept. While from our standpoint we are without a theater level nuclear deterrent, the close battle space in our forward defensive areas has been shrunk to its pre-1970's levels, and we are apparently without a carefully thought out strategy defining the linkages, if any, between the conventional imbalances at theater level and our remaining nuclear capabilities.

It is on this basis, and on the fact that in fielded systems we are not much, if any, better off today than when the Task Force studied the problem three years ago, that I must conclude that what was three years ago described as a situation approaching a matter of national urgency, is now a full blown matter for urgent national priority. It is especially so because of the theater and strategic level linkages between the proposed INF Treaty and the conventional force balance in NATO's Central Region. In short, it's our move.

THE BATHTUB OF IGNORANCE
WHAT IS KNOWN ABOUT SOVIET RDA SYSTEM

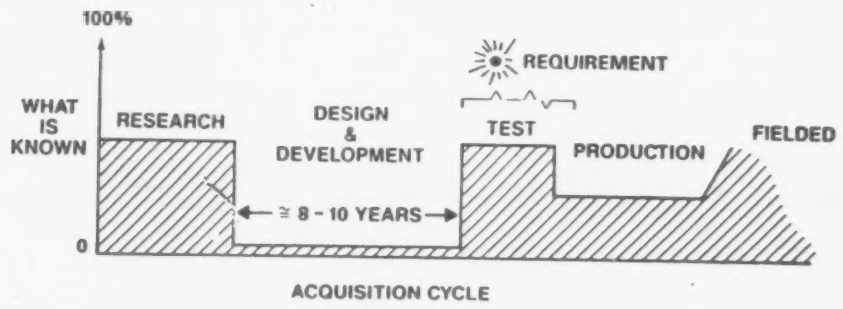


CHART 1

BLUE BULLETS VS RED ARMOR

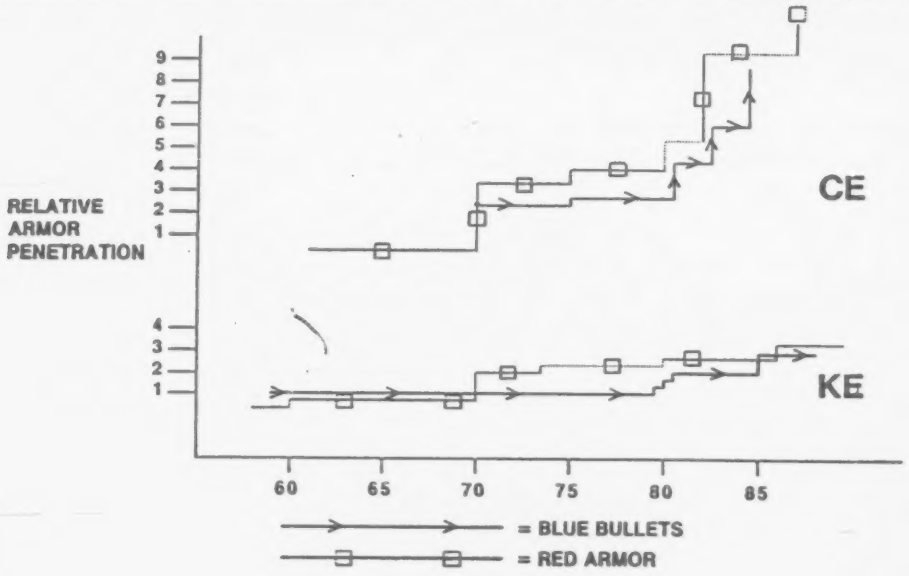


CHART 2

RED BULLETS VS BLUE ARMOR

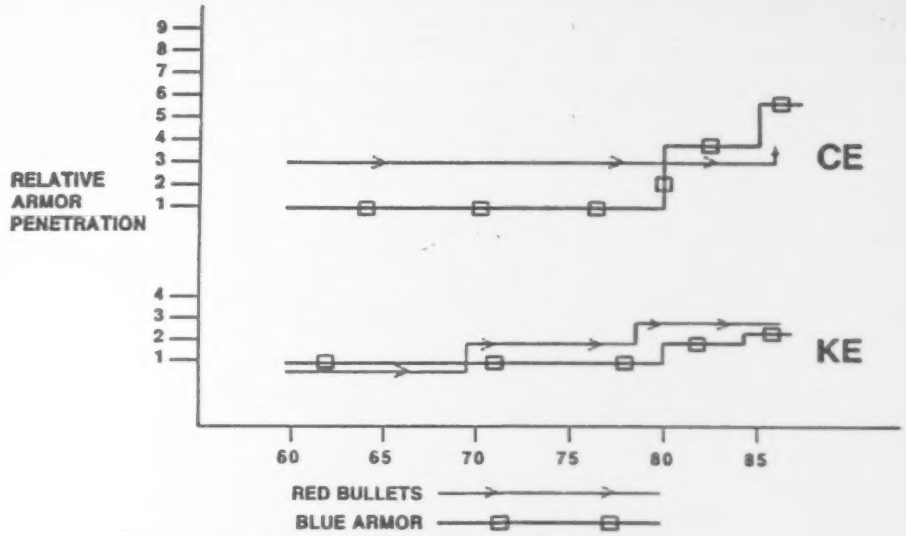


CHART 3

Senator LEVIN. Thank you, General Starry. We will ask you some questions and then get back to our other witnesses.

Let me reference the same statement of yours that Senator Cohen was referring to a moment ago. You said today the combination of composite or ceramic armor reactive appliques has likely made obsolete every fielded system, especially every fielded anti-tank guided missile with a shape charge warhead.

ANTI-TANK MISSILES

If the war started tomorrow, are you saying that our bullets, and here I mean our anti-tank missiles, would bounce off Soviet tanks?

General STARRY. That is correct. If they hit across that front 120 degree, 110 degree sector, whatever the protection fan is across the front of the tank where the heaviest armor is, that is correct.

Senator LEVIN. Now, you are familiar with the Army's plan to upgrade its anti-tank missiles to ensure that they do not bounce off Soviet tanks. How good is that plan?

General STARRY. May I have the question again, please?

Senator LEVIN. How good is the Army's plan to cure that problem?

General STARRY. I would judge the plan to be adequate. The question is whether or not it is moving fast enough to redress the growing imbalance in the fielded systems.

Senator LEVIN. Well, the Science Board, as you have testified and pointed out and participated in, said a few years ago that the armor/anti-armor situation was a matter of urgency. You have upgraded that today from urgent to critical.

Yet, the budget that we have before us proposes that we cut back funding for fighting vehicles, tanks, missiles, and ammunition. I am wondering whether or not that budget is consistent with our conviction that this is an urgent item.

General STARRY. I honestly do not believe it is, Mr. Chairman.

Senator LEVIN. You have also pointed out that the INF Treaty has made the armor/anti-armor problem even more critical. It is my understanding that the Army was given so little to plan on in the 5-year plan that they are going to end the attack helicopter production, shut down tank production lines, and slow development of new fighting vehicles. Does that make sense to you?

General STARRY. No, it does not.

ARMOR MODERNIZATION PLAN

Senator LEVIN. On page 3 of your testimony, you say that we have never been able to establish a modernization plan equal to or better than that of the threat, so we are behind and we are getting further behind.

We seem to have trouble introducing block improvements to our combat vehicles. Should we now be working on block improvements that we want to field on the M1 tank by 1995?

General STARRY. We should not only be working on block improvements, but we ought to be looking seriously at whether or not the threat demands and the technology allows us to take a technical leap ahead and what some people call a skip generation vehicle.

Senator LEVIN. Given the rate of modernization by the Soviet Union in the area of armor warfare, a modernization rate which is four times that of ours, are we providing too little of our modernization effort for the land warfare part of modernization?

General STARRY. My judgment would be that we are probably not providing enough resources. I would also caution that it may also be that the resources we do have are not focused on the critical problems sufficiently.

Senator LEVIN. I am going to ask you a question which I believe is unclassified, but let me be careful in this area as well because we can save this for a later session.

Recent disclosures have touted the development of a new depleted uranium armor protection for the M1A1 tank. Will this armor stand up against long-rod kinetic energy rounds developed for the most modern Soviet tanks as well as chemical energy warheads in most Soviet anti-tank missiles?

General STARRY. Mr. Chairman, I think we would prefer to hold that for the closed session if you do not mind.

Senator LEVIN. Thank you. We will do that.

U.S. FOCUS ON AMMUNITION DEVELOPMENT

If the Soviets have developed protection packages that effectively defeat our current inventory of chemical energy weapons, where should the United States focus its ammunition development?

General STARRY. On the chemical energy side we ought to focus on tandem warheads; that is, dual warheads in the same missile. The first one, of course, is designed to clear off the boxes or what-

ever applique is on the outside, and the base charge is designed to go through the base armor on the tank itself.

When the task force returned its findings 3 years ago, we believed that we might be able to do that by increasing the diameter of the warhead, the effectiveness of those shape charges being by and large a function of diameter. It is now my belief that that is not possible, that no unitary warhead is going to be sufficiently effective to go through that. So we ought to focus our attention on tandem warhead developments, and that in fact is being done, as my colleagues here will relate in due course.

On the kinetic energy side, we need to look at advanced penetrator material technology; that is, as opposed to depleted uranium and some of the other materials. It now appears that tungsten and some advanced metallurgy designs promise a greater penetrating capability than perhaps even the depleted uranium. We have embraced depleted uranium penetrators and marched ahead on that technical course for some years. We need some research and development to see whether or not that is the right course of action.

Senator LEVIN. Thank you. My time is up. According to our early bird rule, Senator Cohen is next.

HELLFIRE OR COPPERHEAD ARTILLERY

Senator COHEN. I would like to come back, General, to the issue I asked you about before. I take it, then, that your charts do not include the Hellfire or the Copperhead artillery round?

General STARRY. The charts do not include the Hellfire. They do not include the Copperhead.

Senator COHEN. Does chart 3 reflect the new depleted uranium armor for our tanks?

General STARRY. It does not.

Senator COHEN. It does not include that?

General STARRY. It does not.

BOFORS BILL AND MILAN 2 TEST RESULTS

Senator COHEN. Do you have the results of the test of the BOFORS BILL and the MILAN 2?

General STARRY. I have not seen those.

Senator COHEN. Has it been done?

General PIHL. Sir, the MILAN test is complete and is pending release now to the Hill. The BOFORS test is underway right now; however, we had to suspend the test today.

Senator COHEN. You had to suspend the test today?

General PIHL. Yes, sir, at the request of the contractor at Fort Benning. The test is under suspension at this minute.

Senator COHEN. Could you tell us about that?

General PIHL. At the present time, sir, there were some problems in terms of hit and kill effectiveness. They had more misses than they had hits, so they had to stop the test.

DRAGON 3

Senator COHEN. Has the Army given any consideration to joining the Marine Corps on the purchase of the Dragon 3?

General PIHL. Yes, sir. We have given a great deal of consideration to that. The Army has 34,000 Dragons in inventory. We would like to product improve 20,000 of those rounds by putting a new warhead on the Dragon. We call that Dragon 2. If we were to proceed to a Dragon generation 3 in concert with the Marine Corps, that involves a new tracker and essentially a new missile system and new inventory for the Army.

The Marines have a much different problem. They are running out of inventory and they need to buy new. At the present time, we would like to buy some and test them so that if we are buying an interim medium system for the infantry it will be based on the results of tests.

M1A1 TANK

Senator COHEN. Has the Army conducted a test between the M1A1 tank and the T72?

General PIHL. Sir, we should defer on that.

FUNDING ARMOR/ANTI-ARMOR AND RESEARCH AND DEVELOPMENT

Senator COHEN. Under the fiscal year 1989 budget, the Army, DARPA, and BTI are all allocating funds toward armor/anti-armor and research and development. How are these being coordinated?

General PIHL. Sir, at the present time we have a steering committee with Dr. Duncan in charge up at the DOD USDRE. The DARPA/Marine Corps/Army memorandum of understanding has worked. I have a brigadier general who works for me who is a full participant in that along with the direction of DARPA. We do coordinate through my science advisor to make sure that the effort is coordinated in the armor/anti-armor area as opposed to separate individual programs.

Senator COHEN. That is all I have right now, Mr. Chairman. Thank you.

Senator LEVIN. Thank you, Senator Cohen.

Senator Shelby.

Senator SHELBY. Thank you, Mr. Chairman.

FIELDING MODERN TECHNOLOGY

On page 3 of your testimony in your discussion of our inability to field modern technology in a timely way, you state, and I quote, "While we may be ahead of the Soviets technically, more and more the advantage is only on the laboratory bench."

General STARRY. That is correct.

Senator SHELBY. Can you give the subcommittee, if you can, a few examples of this problem where if we are ahead technically it is still in the lab, or does that call for another session?

General STARRY. I think just as a general statement, it is fair to say that we are ahead in microprocessor technology and some computer technology. We are ahead in airframe design and development. We are probably ahead in avionics. There may be some other lesser included defenses there, but I think that about runs the gamut.

FIBER OPTIC GUIDED-MISSILE (FOG-M)

Senator SHELBY. Do you believe that the FOG-M is a victim of this type of problem? You know, it was an anti-armor system, then has become part of our air defense, and now I understand it is a candidate for anti-armor again.

Is that part of that problem?

General STARRY. That is hard to say. Fiber optic has really not been around that long. I would say it probably is not a victim.

Senator SHELBY. General, do you have a comment?

General PIHL. Yes, sir. The initial Fiber Optic Guided-Missile (FOG-M) a product of our laboratory down at Huntsville, Alabama, came into the air defense arena in January 1986 in order to hit hovering helicopters behind the hill and at long ranges. We are taking that same technology into the Advanced Anti-tank Weapons System Heavy (AAWS-H) competition as one of the candidate technologies.

We have funded our laboratory system on what I will call a level of effort basis. In other words, so many dollars per year have been allocated to Fiber Optic Guided-Missiles. We need to switch that to milestone funding; in other words, set a date by which we want the system into the inventory and spend the money accordingly.

Senator SHELBY. In your opinion, is the FOG-M a real breakthrough in this regard?

General PIHL. Sir, I believe in terms of the technology for command and control from where the commander will sit to be able to look down the wire at the target, it truly is. We have to have a similar integration so that the warhead technology and the kill mechanism matches the command and control.

Senator SHELBY. As far as Soviet nightfighting capability, are we up to that or are we ahead of them basically? Can you answer that?

General SHOFFNER. Sir, you have hit an area where we have a strong advantage, and where we do not see the Soviets doing some of the things which his doctrine demands that he must do in order to have continuous combat operations. It is our belief that he would turn to added illumination in areas of his main attack, and in those areas he would spend the effort required with conventional illumination rounds to provide the vision necessary to conduct his main effort.

However, that is only a very small part of the battlefield, and a large portion of his force then is vulnerable to attack by our other systems which give us a tremendously strong advantage of fighting at night. This is an asymmetry in my view which we enjoy.

Senator SHELBY. General, I want to ask you again about the FOG-M. If we are going to move it into the battlefield, so to speak, we had better get moving there, had we not?

General PIHL. Yes, sir, that is correct.

Senator SHELBY. What are your plans? What are you all asking for there?

General PIHL. Right now, the FOG-M is the Non-Line of Sight (NLOS) component in the forward arena in terms of air defense. I can get that number for you, sir.

Senator SHELBY. Please furnish that for the record.

[The information follows:]

FIBER OPTIC GUIDED-MISSILE [FOG–M]

The Army's Fiber Optic Guided-Missile (FOG–M) is in development to perform the Non-Line of Sight (NLOS) mission for the Forward Area Air Defense System (FAADS). The Army program manager is ensuring that the FOG–M in development for NLOS will also meet or exceed the requirements for the Advanced Antitank Weapon System-Heavy (AAWS–H).

In fiscal year 1988, the Army will begin the proof of principle testing of the 10 kilometer range, television seeker missile fired from High Mobility Multipurpose Wheeled Vehicle (HMMWV) launchers. The testing, called Initial Operational Evaluation (IOE), will be finished in March 1989. The beginning of the Full Scale Development (FSD) of the advanced system (extended range, high/variable speed missile, improved navigation, more lethal warhead and a seeker capable of day/night/adverse weather operation) will also begin in fiscal year 1988. The Request for Proposal (RFP) was released to industry in November 1987. Responses to the RFP are due to the Army by April 29, 1988. The decision reviews for the Milestone II FSD go-ahead are scheduled to be complete in July 1988. Contract award will be in August.

The fiscal year 1989 budget request for NLOS FOG–M is $114.5 million. The fiscal year 1989 plan provides for the FSD effort of a prime contractor team, completion of the IOE, issuing the IOE hardware to an Army troop unit at Fort Bliss for doctrine, tactics and techniques experience, and for Technical Risk Reduction (TRR) work to be performed by the Research, Development and Engineering Center (RDEC) at Redstone Arsenal, Alabama. The TRR program will provide the Army alternative hardware components that meet the advanced system requirements, provide engineering expertise to help solve development problems that are encountered by the prime team, and will provide alternative vendors for components that may introduce greater competition to the FSD phase. Current cost estimates show that an additional $30 million is required to complete all these actions and the Army is looking for a source for these funds.

Low Rate Initial Production (LRIP) will begin in fiscal year 1991 to field the first unit in fiscal year 1992. Advance procurement funds will be requested for fiscal year 1990 to support the LRIP effort.

General PIHL. In terms of its anti-tank capability we would need to increase that funding in 1989.

Senator SHELBY. And, as you say, couple the armor penetrating capability with the finding?

General PIHL. Yes, sir. We have appointed a project manager. FOG–M is an Army project-managed system, and we are moving it out of the laboratory into full scale engineering development as a part of air defense. We now need to add the companion piece for anti-armor.

COMMAND AND CONTROL TECHNOLOGY

Senator SHELBY. Do you think that is one of your big scientific breakthroughs?

General PIHL. Again, I will go back to the use of the technology for command and control, sir. Yes, I believe so. Now we have to integrate it into a weapons system.

Senator SHELBY. Can it be done?

General PIHL. I believe so.

General SHOFFNER. Sir, let me talk to that if I may.

Senator SHELBY. Yes, sir.

General SHOFFNER. Last summer when we did the final review of the statement of required operational capabilities, it was carefully reviewed in light of the point General Starry made on being able to expand the battlespace. At that time we carefully added to the command and control requirement for what previously had been the air defense system and set in place changes to the software in

the command and control arena that would enable that weapon to be employed as an anti-tank weapon as well as an air defense weapon.

The technology is there. It is a question of how you do the integration into the battle and the requirements for the command and control software that will enable that weapon to be employed as an anti-tank weapon from a vantage point of the supported force commander. Those changes have been made and are, in fact, being done, and I believe the system will continue to be developed with a very deliberate anti-tank and anti-helicopter capability to support the commander and specifically enable us to get some additional range with the expanded battlespace which General Starry referred to.

Senator SHELBY. My time has expired. Thank you, Mr. Chairman.

Senator LEVIN. Thank you, Senator Shelby.

Senator Quayle.

Senator QUAYLE. Let me ask unanimous consent to put in an opening statement of mine, and I also have some questions for the record from Senator McCain.

Senator LEVIN. Thank you. Of course your opening statement will come right at the appropriate place in the record.

[The prepared statement of Senator Quayle follows:]

PREPARED STATEMENT BY SENATOR DAN QUAYLE

Mr. Chairman, I am glad that we decided to have a hearing focused on this very important aspect of our conventional forces.

The tank has become perhaps the most critical weapons system on the modern battlefield. The tank is certainly the centerpiece of the massive Soviet Army opposing NATO forces.

While the INF Treaty has kindled renewed interest in the state of our conventional forces, some of us here have expressed previously our concern over the current state of these forces as well as the trends of our conventional forces relative to those of the Soviet/Warsaw Pact.

We must devise ways to deal effectively with the massive Soviet armored armies of the Warsaw Pact which have always had the edge on us in quantity and threaten now to make marked gains over us in quality as well.

General Starry has described the armor/anti-armor situation as a matter of national urgency. I agree that we must find ways to cope effectively with the continually increasing Soviet buildup of modern Soviet tanks.

I hope that we are wise enough and innovative enough to devise solutions to the armor/anti-armor problem beyond the traditional method of simply punching holes through frontal armor. Perhaps we'll hear some of that this afternoon.

I commend our chairman, Senator Levin, for deciding to hold the hearing—I understand that both General Starry and General Pihl are well-known both within and outside the Army as truly professional "tankers".

I look forward to your testimony.

ARMOR/ANTI-ARMOR PRIORITY

Senator QUAYLE. I would like to get a sort of feel on the priority from the Army's viewpoint as far as the armor/anti-armor. Is this the top priority that we are working on, and how does this relate to other concerns that you have?

General PIHL. Sir, we looked at the Army's situation regarding our budget request. We have a plan that we have put together, a plan that will become a program from the 1990 to 1994 time frame. So it is a top priority for the Army. Right now in a chart which I will show you in a little prepared opening statement that I have,

one-third of our procurement budget, if you count the rules within the various appropriations where armor/anti-armor systems are, we are spending about $5 billion in the present budget on armor/anti-armor.

In doing that, we want to continue the modernization of the Army by keeping open the lines that produce the current systems, such as the Apache helicopter, the M1 tank, the Bradley Fighting Vehicle, and we are working hard to make sure that our needs are known within the Department to give us that level of resource to buy those systems. There is no doubt that when we turned in our Program Objectives Memorandum (POM) right after the Defense Science Board to which General Starry referred, we did take action to keep those lines sustained, tanks, Apaches, Bradleys, AHIPs, in order to have the modern equipment that we need. The question now is sustaining that effort.

There was a previous Army program that went to Defense that had those lines closing. Our aviation lines are all closing between the years 1990 and 1991. The tank line under those plans was going to close in 1991. We have redressed that imbalance. The Department, in the case of aviation modernization, plussed up the Army's accounts in the present budget request, and we need to get that same level of sustainment now from 1990 to 1994.

Senator QUAYLE. In the scheme of things you have the armor/anti-armor as a top priority. Keeping the acquisition lines of the programs you mentioned is also a top priority.

Are there other things that you are working on that you would put in this general realm of top priorities that the Army is concerned about, or would you leave it at what you have just said?

General PIHL. Certainly, sir, we are trying to present a balanced force, and we are trying to address deficiencies vis-a-vis the threat.

Senator QUAYLE. How do you see some of the emerging threats?

General PIHL. In terms of the JCS net assessment, counterfire and the ability to address Soviet artillery, counter-chemical weapons or chemical deterrence, armor and anti-armor, and our ability to get our troops mobile to the other side as far as air and sea lift are concerned. So we take a look at the broad range of capability to get a balanced force into the field.

Senator QUAYLE. Did you look at the TBM threat?

General PIHL. We have, sir.

Senator QUAYLE. Where would you put that in the scheme of things?

General PIHL. In terms of the antitactical missile system and the ability to at the present time extend Patriot into that capability and then eventually build an ATM system, we have a space defense command that works as a part of SDI that is working on that problem right now. That is a significant problem for us.

Senator QUAYLE. Is that also in the priority category?

General PIHL. Not at the same level of urgency as armor and anti-armor, sir, in my personal opinion.

TANK VULNERABILITY

Senator QUAYLE. How many different ways are there to kill a tank?

General PIHL. Sir, several: from the ground; from the air; underneath.

Senator QUAYLE. When you say several, you mean quite a few; right?

General PIHL. Yes, sir. Chemical energy, kinetic energy, air launch platforms, ground launch platforms, infantry platforms, and in some cases you can stretch artillery to do that.

Senator QUAYLE. I have not been here for the entire testimony, but how much attention has been paid to the possibility of mines being used to kill tanks?

General PIHL. Sir, in the research and development of mines, we have one of the overmatch capabilities as a mine, the wide area mine where we would have a smart mine out on the battlefield that would detect the presence of a tank and fire remotely and destroy it.

Senator QUAYLE. Do they have something like that?

General PIHL. Sir, not to our knowledge.

Senator QUAYLE. Are they working on something like that?

General PIHL. Probably.

Senator QUAYLE. Would that present a problem if they had something like that?

General PIHL. Yes, sir. Maneuver and countermaneuver are significant ingredients to this equation.

Senator QUAYLE. Do we have mines that can withstand fuel-air explosives?

General SHOFFNER. I think the answer to that is yes. Some do and some do not. As you define that fuel-air explosive, that definition has some bit of variance associated with it, as you know.

Senator QUAYLE. But we assume that the Soviets are working on something like we have, and we feel that would present a problem to us; is that correct?

General PIHL. Yes, sir.

Senator QUAYLE. Was there much attention paid to that in the testimony on mines?

General PIHL. That is the first time we have brought up mines today, sir.

Senator QUAYLE. It is the first time, but is it important?

General PIHL. It is very important.

Senator QUAYLE. Okay, it is.

ARMOR/ANTI-ARMOR FORCE PROJECTION

What is the relationship and how do you see this debate going between the heavy and the light infantry? Do we have the right force projection? Where do you think we ought to be going in that area?

You know the debate whether we ought to make them heavier, and if they are heavier, then we get into readiness and mobility, a transportation problem, and if they are heavier can they really be that effective on the battlefield.

Where are we going?

General SHOFFNER. Well, hopefully, first, we will go where our Nation wants us to go.

Senator QUAYLE. Where should we be going? You tell us.

General SHOFFNER. Let me tell you where I think the problem lies. It is a global problem, sir, and we will be required to deal with it. We cannot exclude one piece of the threat at the expense of the other, so the challenge that the Army has is to be able to respond to the threat presented by the Soviet worldwide, him or his surrogates. That requires us to deal with a full, mature threat with mainline equipment as we are talking here today. It requires us to deal with the flanks of the Eurasian land mass, which has a major deployment problem, that makes lift and getting there, strategic lift, very critical, as well as dealing with the small wars or low intensity conflicts.

We just demonstrated, I think, a couple of weeks ago the value of being able to rapidly deploy the force to deal with a small threat. I think that we will have to deal with a balanced approach to our forces that will give us the ability to respond globally to the threat, and it is quite varied.

We will never respond alone. However we respond, it will be through a joint effort with the Navy and with the Air Force, and it will be focused to achieve a unified action as opposed to individual elements working out. So as we talk about individual items of equipment today at the same time, I would hope that we continue the focus on improving our ability to fight as a joint, combined force.

Senator QUAYLE. My time is up, but please let me follow up.

I guess I am trying to get the answer on where you think we need to focus on doing things on a heavier basis and where you think we ought to focus on doing things on a lighter basis. Maybe you could either answer that question or, Mr. Chairman, they could furnish it for the record.

I would just be curious as to where you think we ought to go.

General STARRY. In the context of the study that we did 2 or 3 years ago in the armor/anti armor business, we addressed ourselves to both heavy and light forces. What we said about light forces then is something like this, regardless of what you think about whether or not you need as many light forces, more, fewer or whatever, there is a growing presence in many, many areas of the world of export arms from all over the world, our country, the Soviet Union and wherever. You are almost always confronted with a situation in which you are going to need some anti-armor capability.

So if you want to have those light forces because they are more readily deployable then the heavy forces, then you are obliged to equip them with the things that will allow them to cope with the threat that you can expect them to encounter in the areas where you are going to deploy them. That requires some of the same systems, at least, or variants of the same systems for armor and anti-armor that we are talking about for the heavy force. So it is quite a similar problem.

Senator QUAYLE. Thank you, Mr. Chairman.

Senator LEVIN. Thank you, Senator Quayle.

After Senator Cohen's questioning, what we will do is turn to General Pihl, who has not yet had an opportunity to make his opening statement.

So Senator Cohen, please proceed briefly.

Senator COHEN. Just one final point.

HELLFIRE MISSILE SYSTEM

I come back to page 3, General Starry, on your statement about the Soviet defensive capability there, ceramic armor, reactive applications have likely made obsolete every fielded system. I asked you again about the Hellfire, and you said that was included in your statement.

If that is the case, why do we get a procurement request for the Hellfire of 5,000 per year? Why would you want to request the procurement of the Hellfire if, in fact, it is obsolete?

General PIHL. Sir, I think it is fair to say that we do not have an obsolete weapons system. The comment deals with overmatch. General Starry's comment says obsolete, sir. I understand that. We can make some improvements in the Hellfire missile system in almost near real time. We can also upgrade the TOW missile system. So we want to cut a running change into production on the Hellfire system that will cause it to stay up with the improving armor. We see no need at this point in time to stop building that particular missile system. It is being fielded on our Apache and will eventually go on the Light Helicopter Experimental (LHX). The question now is to get that product improvement into the production process as quickly as we can.

Senator COHEN. So in other words, you will use the old Hellfires against the non-Soviet tanks?

General PIHL. And against most aspect angles of the most modern Soviet tanks, sir. I want to be very clear that we have been talking about the frontal attack of that system in terms of frontal attack; that is shooting straight at the front, one on one.

Senator COHEN. The Hellfire does not do that.

General PIHL. The Hellfire comes in at an oblique angle guided by a laser beam and right now will destroy the tank all the way around the cardiod.

Senator COHEN. That is why I have been confused about the nature of the testimony concerning the effectiveness of the Hellfire and the last of it. I am still not clear.

General PIHL. Sir, we believe it to be effective, and we need to grow its effectiveness.

Senator LEVIN. Just on that point, you, as I understand it, are recommending, I believe, $14 million that we add to this budget to do that; is that correct?

General PIHL. That is correct, sir.

Senator LEVIN. Is that going to be part of your testimony or at least you will be prepared to support the request?

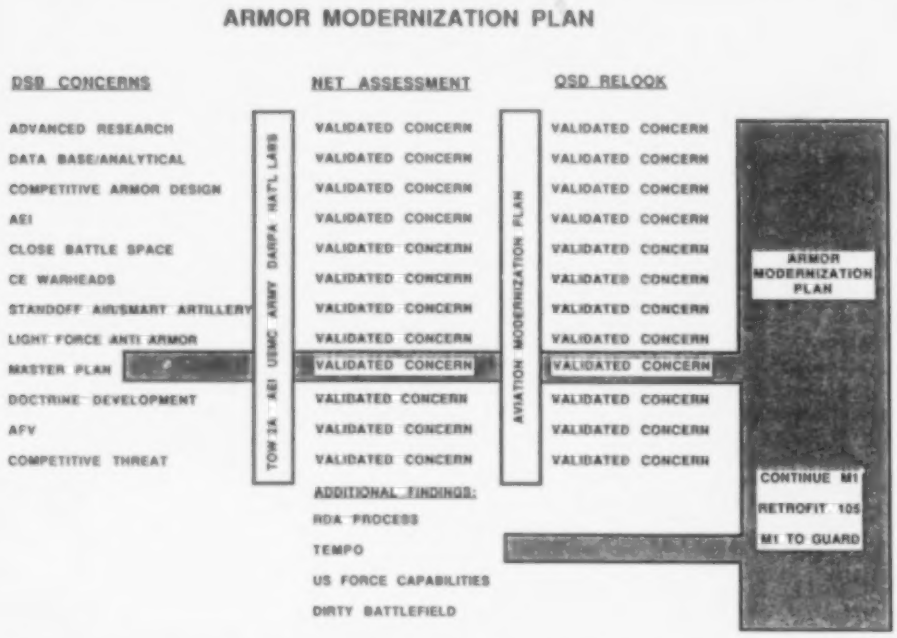
General PIHL. I will.

Senator LEVIN. All right, then.

Let us turn to you, General Pihl, for your opening statement.

STATEMENT OF LT. GEN. DONALD S. PIHL, USA, MILITARY DEPUTY TO THE ASSISTANT SECRETARY OF THE ARMY (RESEARCH, DEVELOPMENT AND ACQUISITION), U.S. ARMY, ACCOMPANIED BY MAJ. GEN. W.A. SHOFFNER, USA, ASSISTANT DEPUTY CHIEF OF STAFF FOR OPERATIONS AND PLANS (FORCE DEVELOPMENT AND INTEGRATION), U.S. ARMY

General PIHL. Thank you, sir. General Shoffner and I are certainly pleased to join General Starry at the table today. We would like to enter our formal opening statement for the record, and then I will paraphrase my remarks. May I have the first chart, please?



Sir, we agree with the Defense Science Board recommendations. We agreed with them then, and we still agree with them now. We did move out immediately after. Some will question how fast we moved out and perhaps how aggressively, but we did move out. We started an immediate program to improve TOW 2A. We put together the armament enhancement initiative to get after our kinetic energy bullets. We did sign, as Senator Cohen indicates, an agreement between the Marine Corps, Army, and DARPA to work on the problem, and we started a research program with our national laboratories to take advantage of the national laboratory system.

General Shoffner put together a net assessment, took a look at the 12 findings of the Defense Science Board, and also looked at the RDA process, operating tempo, U.S. force capabilities, and a little bit about the dirty battlefield. So we took a somewhat broader look. From that came the need for a master plan, and I draw that arrow all the way over to here (indicating). OSD under Mr. Fredericksen's guidance, the Tactical Warfare Programs Officer up at DOD, also took a look just after the net assessment and wrapped that up

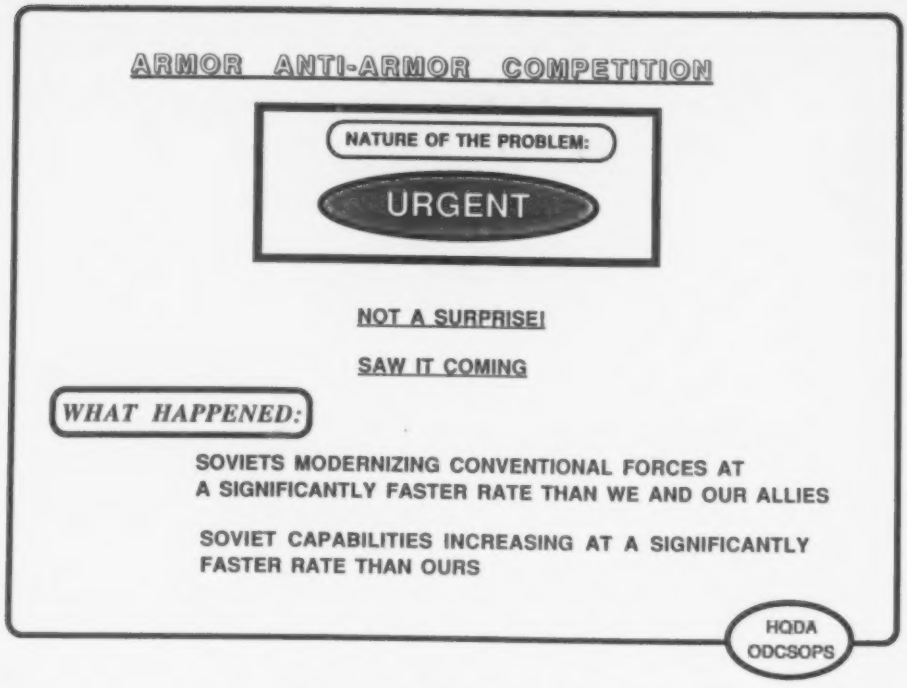
about 2 months ago. Eventually we continued to validate the concerns as raised by the Defense Science Board 3 years ago.

ARMOR MODERNIZATION PLAN

Now, we put together an armor modernization plan. I want to be very clear that that is a plan. We intend to take that plan into the summer review at OSD as a part of the debate to talk about the resources to solve this problem. We think we have a good start to this plan in the 1989 budget both in procurement and in R&D and are not over here in any sense saying you need to increase the Army's resource on that in the immediate near term.

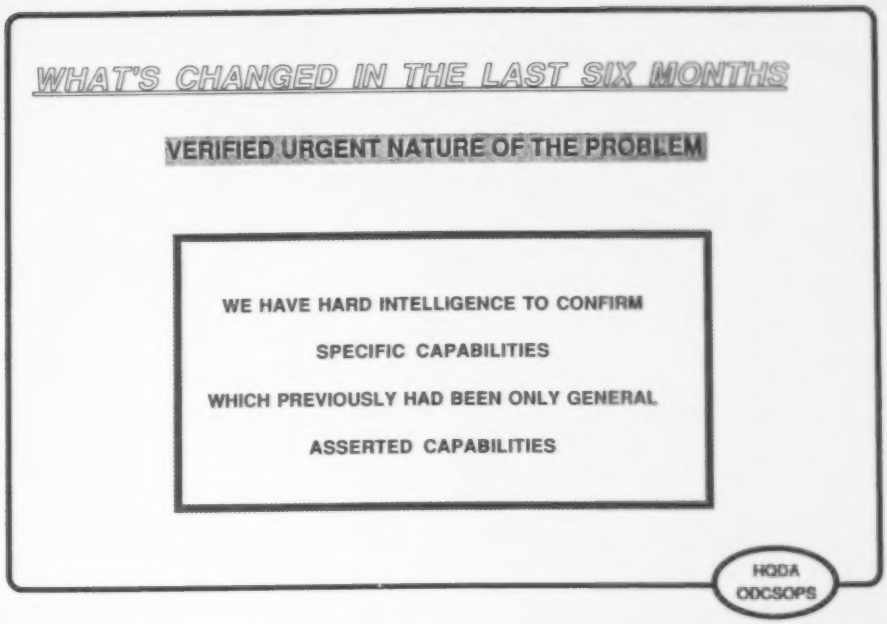
We do, however, need to increase our resources over a period of time in 1990 to 1994 so that the key ingredients to our plan, and there are three down here in the bottom corner on your right that I want to add that we think are very important. They were not specifically or explicitly delineated in the Defense Science Board but they are to continue the M1 tank, because the most important antiarmor system we have is our armor system.

We want to look at our 3,200 pure M1 tanks and look at the retrofit of them from a 105 gun up to a 120 gun. One of the most important decisions we made was to go to the 120 gun. Then finally, we want to put the National Guard into M1 tanks by distribution and new procurements rather than upgrading the M60 tank into an M60A4 version. The reason, survivability of the new armor that we have just put into the M1 and lethality, what capability the 120 gun gives you over the M60, which right now is in the 105 caliber. General Shoffner has three charts that he will brief from his seat at the table, and then I will pick back up again.

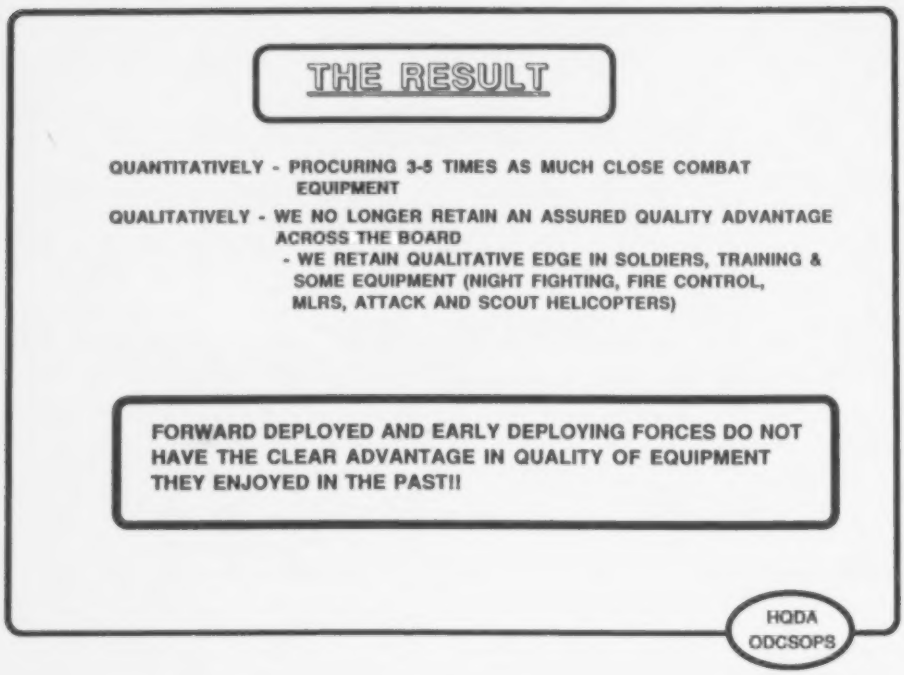

ARMOR ANTI-ARMOR COMPETITION
NATURE OF THE PROBLEM:
URGENT
NOT A SURPRISE!
SAW IT COMING
WHAT HAPPENED:
SOVIETS MODERNIZING CONVENTIONAL FORCES AT A SIGNIFICANTLY FASTER RATE THAN WE AND OUR ALLIES
SOVIET CAPABILITIES INCREASING AT A SIGNIFICANTLY FASTER RATE THAN OURS
HQDA ODCSOPS

ARMOR/ANTI-ARMOR COMPETITION

General SHOFFNER. As mentioned earlier in the testimony, the fact that this condition exists in the relative capabilities is not a surprise. It was foreseen, but what has happened is that the rate of modernization has occurred much greater than anticipated, and that rate of modernization has not been limited to just armor and anti-armor systems. The Soviet has modernized his conventional forces across the board at a much more significant rate than we. May I have the next chart?



I will talk in more detail for you, sir, in the closed session, but in trying to answer this question I would say in the past few months, 6 months, 9 months, we have had sufficient solid intelligence to confirm specific capabilities that previously were only asserted, and it is that work which is done and is being done and will continue that verified the urgent nature of the problem. We have verified the specifics of the performance capabilities, and I will talk to those, sir, and answer some of your questions in more detail in the closed session. The results of our net assessment are shown in the next chart.


THE RESULT
QUANTITATIVELY - PROCURING 3-5 TIMES AS MUCH CLOSE COMBAT EQUIPMENT
QUALITATIVELY - WE NO LONGER RETAIN AN ASSURED QUALITY ADVANTAGE ACROSS THE BOARD
- WE RETAIN QUALITATIVE EDGE IN SOLDIERS, TRAINING & SOME EQUIPMENT (NIGHT FIGHTING, FIRE CONTROL, MLRS, ATTACK AND SCOUT HELICOPTERS)
FORWARD DEPLOYED AND EARLY DEPLOYING FORCES DO NOT HAVE THE CLEAR ADVANTAGE IN QUALITY OF EQUIPMENT THEY ENJOYED IN THE PAST!!
HQDA
ODCSOPS

INTELLIGENCE NET ASSESSMENT

Quantitatively, there is nothing new there, and I will just tell you that I agree with those general statements that are available today in the press about the rate at which the Soviet is modernizing and the various capabilities. In many aspects he has fielded good equipment, very good equipment, in numbers that are causing problems for the entire set of NATO forces. Qualitatively we do have advantages, and we are able to exploit those advantages. General Starry mentioned some that we have been able to bring from the technology base to the field: our ability to fight at night; the fire control capabilities; the capabilities that we have with the multiple launch rocket system, as well as the capabilities of our modern attack helicopters.

Those capabilities are there, and because we choose to fight as a combined arms team and not just as a tank duel or an anti-tank guided missile duel with a tank, we believe that we can put up a good, competent, stiff fight. But there are areas today where the Soviet has the advantage in equipment, and we feel that we need to move out urgently to deny him that advantage. Our forward deployed and early deploying forces today do not enjoy the clear advantage that they have had in the past, and we feel that there are some very significant efforts required to correct those.

General PHIL. If I might have the next chart, please.

OSD RELOOK CONCLUSION

Much of what the DSB recommended has been implemented.

Satisfactory progress has been made in demonstrating promising armor/anti-armor technologies.
Recent exploitation provides a more exact understanding of current imbalance.
Significant increase in commitment to land warfare required.
Requires some reallocation of defense resources from other important warfare areas.

Sir, I would focus now on what the Defense Department's relook at the Defense Science Board says. Much of what the Defense Science Board recommended has been implemented. There has been satisfactory progress in demonstrating armor and anti-armor technology. The recent exploitation which we can go into in closed session has really given us quite an insight into this problem.

Their conclusions are that a significant increase in commitment to land warfare is required, and it will require some reallocation of defense resources from other important areas. This is a draft report right now which is working its way through the Defense Department.

General PIHL. Next.

ARMOR/ANTI-ARMOR FISCAL YEAR 1989 RESOURCES

[In billions of dollars]

Appropriation	Fiscal year 1989—	
	Total	A3
WTCV	$2.96	$2.38
MIPA	2.59	.37
APA	2.79	.94
PAA	2.01	.40
RDTE	5.03	1.06
Totals	15.38	5.15

DEPARTMENT OF THE ARMY OVERVIEW OF THE ARMOR/ANTI-ARMOR MASTER PLAN

This is our appropriation-by-appropriation title and an accounting that we have put together which we say adds up to $5.15 billion. That particular program brings in 545 M1s, 581 Bradleys, 72 Apaches, 57,000 rounds of 120 millimeter kinetic energy ammunition, and continues the procurement of 12,000 TOWs and 5,000 Hellfires. So if you take a look at it from the appropriations that I manage, one-third of our budget is devoted to the armor/anti-armor proposition, and we need to sustain that.

The next slide, please.

OVERVIEW

Continues current tank, fighting vehicle, and tank killing munitions production.
Explores the retrofit of basic M1 with 120mm gun.
Examines redistribution of M1s to the Reserve components.
Limits MODs to AH-1 helicopters.
Continues to improve anti-armor systems.
Fixed level of expenditure for armor/anti-armor.

We did an aviation modernization plan. Then we used that as a model for the armor plan. It continues the production of our current tank and fighting vehicle systems, explores the retrofit of the 120 as I have described, examines redistribution of the M1s with

the Guard. We have limited the MODs to the COBRA helicopter because we have the Apache being fielded. We continue to improve anti-armor systems, upgrade the Hellfire and the TOW, and again try to get level funding within the armor/anti-armor budget.

May I have the next slide, please?

PROCUREMENT

M1A1 Abrams—continues production at 516 per year.
M2/M3 Bradley—continues production at 336 per year.
AH–64 Apache—continues production at 72 per year.
Tank killing munitions:
    TOW 2A 12,000 per year.
    Hellfire 5,000 per year.
    120mm tank ammo 57,000 per year.

These are the procurement highlights that I just talked to that represent the budget.

Next.

MODIFICATIONS

Block improvements to M1.
Upgrades M1 armor.
Bradley MODs:
    Reposition ammo.
    Spall liner.
    Applique armor.
Considers depot retrofit of M1 with 120mm gun—examines affordability.
Does not pursue M60A4.

PROCUREMENT HIGHLIGHTS

We do have three block modifications to the M1 tank on the book, Block II and Block III, and one of the things we need to do is to work that in parallel with the armored family of vehicle task force. To look at that point out in 1995, 1996 as to whether or not we want to put Block III MODs onto the M1 tank or shift to the armored family of vehicles, we probably ought to do both but at the present time we think that the right thing to do for planning purposes is to look forward to Block III MOD to the tank.

We have upgraded the M1 armor, and we will continue to tune up that armor that we announced about 3 weeks ago. We have done significant survivability MODs to the Bradley Fighting Vehicle. Both of these come out of our live fire testing we have conducted at Aberdeen Proving Ground. We are looking at the retrofit program and again trying to not pursue any improvements to the M60. We would rather shift the Guard into M1 tanks.

OPTIONS FOR CATCH-UP

We do have some options for catch-up, and we have talked to a few of them: the hypervelocity system, clear overmatch. We want to get a large kinetic energy missile flying downrange; the FOG–M which we discussed previously in the questions; and the wide area mine which Senator Quayle brought up. Sir, that completes my briefing, and we are prepared for your questions.

[The prepared joint statement of General Pihl and General Shoffner follows:]

JOINT PREPARED STATEMENT OF GENERAL PIHL AND GENERAL SHOFFNER

Good afternoon Mr. Chairman and members of the committee. It is a pleasure for us to appear before your committee to discuss Armor Anti-Armor. It is also a pleasure to rejoin our mutual mentor, General Starry. Much of the current doctrine in our Army stems from General Starry's work to change the future of land warfare when he served as Commanding General of the Training and Doctrine Command. More recently he co-chaired, with Dr. Braddock, the 1985 Defense Science Board which conducted an extensive assessment of the status of Armor Anti-Armor between the U.S. and the USSR.

The Army agreed with the DSB conclusions in 1985 and still agrees with the conclusions that we are behind the Soviets. We need to regain the lead and maintain that advantage.

The Defense Science Board Report was of great value to the Army. The DSB accurately predicted Soviet use of reactive armor, the increased Soviet numerical advantage and their continuing high modernization rate. As we know, the DSB predictions subsequently have been verified by the intelligence community.

The Army was not surprised by these developments. We have been pursuing technologies to counter the Soviets' A3 improvements, the TOW 2A missile being just one. Our management is in place, and we are further improving our A3 focus as you will hear in the closed session. More resources will be required to close the gap and regain the initiative and we will address that, giving details, in the closed session.

The Army has not been standing still since 1985. Many actions based on the DSB recommendations have been initiated, as outlined in the following paragraphs. Some are short-term, quick fix solutions, and results are just beginning to show. Many are long term initiatives whose results will not be seen for several years.

DARPA A3 Joint Program Office: The Army signed an MOU agreeing to provide personnel and funds for a 3 year period. The people are at work and the funds have been provided in the agreed amounts for 1986, 1987 and 1988.

Competition in the Tech Base: University of California, San Diego was designated a Center of Excellence for ultra performance of materials with designated funding; use of BTI funding for A3 related programs (electromagnetic guns) is underway; spin-off work in electromagnetic and electro-thermal guns through DOE and SDI is being done by the tech base.

Databases: Although this recommendation was not directed at the Army specifically, we recognized that we had much room for improvement. The Army has procured two supercomputers for use by Ballistics Research Laboratory. A hypervelocity penetration mechanics program has been initiated for current and advanced armors and penetrators.

AEI: The program has been focused on technologies that will defeat the threat at time of projected fielding. Promising approaches have been pushed and downselect points designated to ensure the best technical approach is pursued. In fact, some downselection has already occurred.

Armor Anti-Armor Master Plan: The Army has supported the preparation of the DOD Master Plan for the last two years. Recognizing that it covers only Anti-Armor, the Army initiated action to develop an Armor Anti-Armor Master Plan. This follows the same conceptual framework as this year's Aviation Modernization Plan. The plan treats continuation of current production systems, product improvements to fielded systems, retirement of old systems no longer capable of defeating the threat, and research and development of new systems. From these modernization plans, the level of funding required can be demonstrated. The Training and Doctrine Command is completing staffing of the initial plan and should forward it to the headquarters soon. It will be provided to OSD as part of next year's Master Plan input. Plan development has been an iterative effort that incorporates the latest intelligence information, program status, operational concepts and updated requirements.

AFV: The Army launched the Armored Family of Vehicles Task Force (AFVTF) in January 1986. The concept has been validated and the AFVTF is tailoring the program to accommodate the Total Army heavy force transition. The AFV heavy force modernization requirements are being structured into affordable, executable warfighting packages based upon the most critical operational needs of the integrated force from now into the 21st century. The current approach is to field early variants as the initial AFV package beginning in the FY 98 timeframe. This plan will require some program funding tradeoffs, is affordable within the projected Army TOA, and is in keeping with the historical share of the Army TOA afforded to heavy force modernization. The remaining AFV packages will be fielded over the next two decades, or sooner as TOA permits.

The DSB report is not the only measure by which the Army has monitored the A3 competition. The large amount of new intelligence over the summer months led to the conduct of a net assessment of the armor Anti-Armor area to determine the specific nature and scope of the problem. The net assessment looked at material, doctrine, organizations and training. We will provide the results of this comprehensive effort during the closed session.

Much of what the DSB recommended has been implemented, perhaps not as quickly as desired, but none the less, progress is being made. Recent exploitations and the net assessment have provided a more exact understanding of the degree of the imbalance.

Additionally, other force modernization actions have provided our soldiers an improved warfighting capability.

In mid-1985, the Army made the decision, in retrospect a wise decision, to push the 120mm gunned M1A1s to forward deployed units in Europe and to field M1s to CONUS units. The decision also required the tanks to be fielded with adequate stocks of 120mm ammunition as part of the package. As a result, our soldiers in USAREUR will soon be completely equipped with this superb tank. A similar policy is being pursued for fielding the Bradley Fighting Vehicle. The result is a modern tank-infantry vehicle team.

The Army continues to push the best fighting equipment to the forward deployed force in Europe. AH–64 Apaches with Hellfire missiles are now on the ground, while we continue fielding of the MLRS system for our field artillery units.

Our soldiers have been provided with a tremendous night fighting capability which gives us a distinct advantage over the Soviets. The thermal sights on our tanks, Bradley Fighting Vehicles, and AH–64s give us new leverage and can make us an Army of night fighters.

The Army is spending just over $5 billion on armor Anti-Armor programs in the FY89 budget that is before you. These programs represent the outgrowth of many actions, including the 1985 DSB study. We believe that they represent the minimum necessary to improve the A3 imbalance. They continue the production of tanks and fighting vehicles with procurement of 545 M1A1s and 581 Bradley Fighting Vehicles. They procure an additional 72 AH–64 Apaches as well as providing substantial R&D funding to develop upgrades for the Apache. Additionally, funds are provided to procure 12,000 TOW 2A missiles, 5,000 Hellfire missiles and some $400M of Anti-Armor ammunition, principally 120mm tank main gun rounds. Funding contained in the budget submission for Research and Development will support work in the 120mm Lightweight Gun, Electromagnetic and Electro-thermal Guns, the Armor Enhancement Initiative and hypervelocity missiles. Continued R&D on TOW 2A Retrofit, TOW 2B, AAWS–M and AAWS–H and product improved Hellfire is also supported.

These systems and projects we have discussed are the highlights of our A3 program. While there is much work to be done, we have aggressive plans and require only sufficient resources to bring them to fruition. The Congress has been supportive of our efforts to date, we thank you for that support. We need your continued support to provide the resources to deal with our shortfall in meeting the A3 requirement. With stable funding and effective management by the Army, in cooperation with the Congress, we can regain and maintain the technological advantage in armor/anti-armor.

With your help and support, we will provide our Army with what is needed for it to continue to serve as a viable deterrent and to be ready should it be called upon to protect this Nation's vital interests.

Gentlemen, we are ready for your questions.

Senator LEVIN. Thank you, General Pihl.

We have heard General Starry testify that we are behind now and are falling further behind in his assessment.

Do you agree with the assessment of the problem as an urgent one?

General PIHL. Yes, sir, I do. It is an urgent problem. There are aspects of the armor/anti-armor problem which we must redress.

OVERVIEW OF THE ARMOR/ANTI-ARMOR PLAN

Senator LEVIN. Now, you have given us an overview of your plan to redress it on one of those charts, and I wonder if you could put

that chart up again. It is entitled Overview. It was like the third or fourth from the last chart.

OVERVIEW

Continues current tank, fighting vehicle, and tank killing munitions production.
Explores the retrofit of basic M1 with 120mm gun.
Examines redistribution of M1s to the Reserve components.
Limits MODs to AH-1 helicopters.
Continues to improve anti-armor systems.
Fixed level of expenditure for armor/anti-armor.

As I understand it, this is an overview of your plan.

General PIHL. That is correct, sir.

Senator LEVIN. This is what we hope to do.

General PIHL. That is right.

Senator LEVIN. This is what we need to do?

General PIHL. This is what we need to do.

Senator LEVIN. If we are able to take some action in this budget to do some of that, I gather that is fine with you.

General PIHL. Yes, sir. There are additions that could be made that would allow you to do some things both in R&D and procurement, but we have, of course, sent the budget to you at this point in time. The question now is as you go into conference what we might be able to do in the sense of working that particular issue.

Senator LEVIN. Or if we are able to do something in the Senate?

General PIHL. Yes, sir. I understand.

Senator LEVIN. You would, I gather support—I do not want to put words in your mouth.

Are you recommending or would you support or be in a position to support our doing any of that that we are able to do in 1989, or should we wait until 1990 for that?

General PIHL. Sir, there are parts of this that can be done in 1989, one of which is to bring the Bradley up to a closer fielding rate with the M1 tank. We certainly can start the R&D on the Block MOD programs.

We can fix the TOW and the Hellfire systems. So there are opportunities there to fix the problem in 1989, yes, indeed.

I might say, Senator, if I could, that I have also costed-out the Defense Science Board recommendations from an R&D perspective. Right now by my calculus we are spending about $490 million this year in R&D on what was recommended by the DSB. So we have sort of put our money down on those recommendations.

Can you do more? The answer is yes. The question then is with the kind of constraints we have faced. We have tried to be responsible and turn in a budget that meets the constraint.

TANK DESIGN

Senator LEVIN. There has been an article in recent days about a new generation of Soviet tanks. One magazine showed a drawing of a tank without a turret.

Is that the right way to go in our tank design?

General PIHL. Sir, it is not a new idea, first of all. General Starry can reflect on his dialogue with other armor experts and perhaps would like to do that. We have been trying to get the tank crew below the turret ring for quite some time now. The idea of an ele-

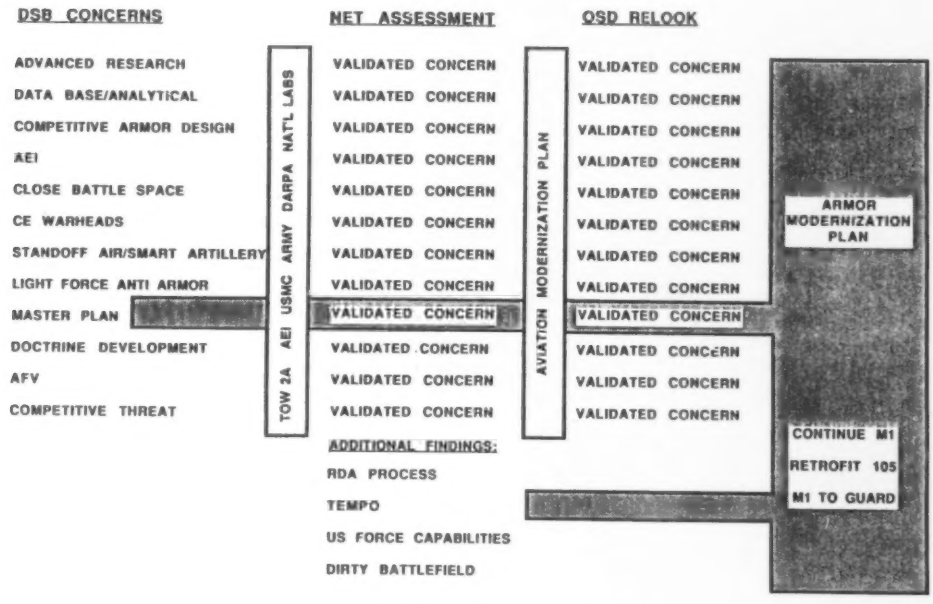
vated gun is perhaps to do that. The ability to fire remotely, clearly the trend line for armor is to get the crew in a survivable position. At the present time we have looked at their concept. It sort of matches a similar concept we had on the drawing board in the early 1980s.

Senator LEVIN. Are we ready to commit ourselves to that?

General PIHL. Sir, I do not think either of us are at this point in time, and we will clarify that for you in a minute.

Senator LEVIN. Finally, also in addition to giving us the overview of your plan, which you need, I gather, as quickly as you can get it to cure the problem which you have identified, you have also given us your modernization plan. I think it is your first chart. Maybe you can get that up for us again, too.

ARMOR MODERNIZATION PLAN



ARMOR MODERNIZATION PLAN

Can you tell us if those items in the lower part of the right-hand column on the armor modernization plan are repetitious of your overview of your plan? Are they part of your plan?

General PIHL. Yes, sir, they are part of the plan. The part I wanted to bring up is that a year ago, as I read the public affairs debate that existed about reactive armor on their side and our ability to deal with it, the equation intended to be the TOW 2A was intended to be the answer to the reactive armor.

The reason why I talk about the M1 tank is we want to start the redress by continuing to produce our fundamental anti-armor system, which is our tank. So that is why I show so explicitly continuance of the M1, retrofitting the 105 gun up to the 120, and getting the Guard into M1 tanks.

Senator LEVIN. Thank you very much.

Senator Cohen.

Senator COHEN. Thank you. I just have a couple of points.

INF TREATY

As I have listened to the testimony, I was going to ask each of you gentlemen as to whether we ought to not ratify the INF Treaty.

What is your opinion on that?

General STARRY. Given where we are, my judgment is we should ratify the treaty. This is not to say that I would have supported the thing in the beginning, but given where we are with the negotiations, I would urge that we ratify the treaty.

At the same time, it is absolutely necessary that we do a number of things, one of which is to describe for ourselves what our strategy is with the intermediate nuclear force deterrent missing from our armaments array in Europe and with the changes in the conventional force imbalance that we have described, the fact that the Soviets, at least in my judgment, have concluded that they do not need that intermediate level nuclear force and that we probably do. All that, by the way, is work that should have been done before we sent the President off to negotiate a treaty.

Senator COHEN. You mean we sent him off to Reykjavik without any armor? Is that what you are saying?

Senator LEVIN. Or anti-armor. [Laughter.]

General STARRY. Or anti-armor.

These are questions that we should have thought out ahead of time. You know, your arms array, your arms menu should support your operational concept, and we have had an operational concept for years that established linkages between tactical and theater level nuclear weapons and the intercontinental ballistic missile nuclear weapons.

Now we have a break in that chain, and we have not yet described for ourselves, at least to my knowledge, where we are with regard to the remaining nuclear weapons in the theater, of which there are numbers, and the intercontinental ballistic missile problem in view of the growing conventional force imbalance in the other guy's favor.

Senator COHEN. General Pihl.

General PIHL. Yes, sir, I agree that we should ratify. JCS supports that. I had a lot to do with the building of the Pershing II and can say that that did a lot in terms of giving us the opportunity for the ratification. As we are doing that, we need to take a look at their conventional force capability.

Senator COHEN. Thank you.

General Shoffner.

General SHOFFNER. Sir, I would support that given that we continue to improve conventional forces that have integral to their tactical nuclear capabilities. That is the course of action that we are pursuing, and in my view, that is a very key piece of what you are doing in your ratification not to remove nuclear weapons from the battlefield completely.

Senator COHEN. What I am struck by is your very lukewarm support for the INF Treaty and your rather red-hot rhetoric contained in your statements, because it is fairly apocalyptic.

If I look at your statement, General Starry, it seems to me what you are saying there is were it not for the INF Treaty we would not be in the fix that we are in right now.

But you take the INF Treaty plus the Soviet improvements in their anti-armor, and what was a growing crisis is now a fullblown crisis.

General STARRY. That was the basis on which I used the word "critical". It is not just a question of a technical flip-flop. It is a question of the fact that it comes about at a very awkward time I guess is the best way to say it.

Senator COHEN. We represent roughly 25 percent of the NATO tanks.

By the way, are we going to go to reactive armor on any of our tanks?

General PIHL. Sir, we have explored reactive armor for the M60 tank.

Senator COHEN. And rejected it, I am told.

General PIHL. And rejected it. At the present time it is on hold, and I can explain that later. We have looked at reactive armor for the Bradley Fighting Vehicle. We are going to deploy a limited quantity of that. The answer to both of those, sir, is we would like to have a better capability than what we have first designed in terms of reactive armor.

Senator COHEN. Is the Marine Corps going to reactive armor?

General PIHL. I believe, sir, yes, that they will buy some quantity of reactive armor, but we had to also increase the capability of the box that we give them.

Senator COHEN. Let me get back to the question now about the percentage of tanks that we have in Europe.

What are our allies doing about their tank vulnerability?

General PIHL. Sir, all of them have looked at the problem as we have. Some of them, such as the Germans, have taken a little bit different approach to their protection capability. We have a very clear understanding of what the British, the French, and the Germans are doing. They are readdressing their protection levels, and they are also, of course, working on their kinetic energy rounds and their missiles as we are.

ANTI-ARMOR TECHNOLOGY

Senator COHEN. Are we sharing some of our high technology under the BTI and other programs in DARPA and others with the Germans and the British in the anti-armor capability?

General PIHL. We are in dialogue with them, sir. We have not shared our latest round of technology.

Senator COHEN. I will save my next question.

That is all I have right now, Mr. Chairman.

Senator LEVIN. Thank you.

Senator WIRTH. Thank you, Mr. Chairman.

I gather that if you had your druthers, General Pihl, there would be other items in the budget that are not in the budget as submit-

ted to us by OSD, and if you had your druthers, and maybe General Starry talked about this, we ought to be doing more in terms of Hellfire missiles; is that right?

General PIHL. Yes, sir. We could increase the quantity of Hellfires at the same time we are fixing them as I described to Senator Cohen.

Senator WIRTH. In CITV we had to do more on that, too?

General PIHL. The block improvements to the tank, that is correct.

Senator WIRTH. Block III improvements, are those the three items?

General PIHL. The block III improvements are something that we would start to get done by 1995 and 1996.

Senator WIRTH. If this is the kind of urgency that has been described by all of you, why is it we are starting in 1990 to get done by 1995?

You know, a taxpayer sitting out there would say if this is the problem, why not now?

General PIHL. In the $299 billion compromise, sir, we were able to restore the $10 billion decrement to the Army, back to a cut of about $6 billion. My budget now is $15 billion procurement and $5 billion for RDT&E. Defense in 1989 gave us the difference in aviation from $1.4 billion up to $3.5, recognizing what we needed to modernize aviation. I suspect that after a very vigorous debate this summer I know they are very sensitive to this problem, and their signals to us are that they intend to help us work this problem during the summer review.

So the question is what priorities apply to the $299 billion level of effort, recognizing we need to keep the Army trained and we also need to keep the Army ready to deploy, and we need tc keep the Army adequately paid. So in the balance that we struck of the $4 billion that was given back to the Army in the final review, most of that came into the procurement accounts to fix the problem that we have discussed.

REPRIORITIZING THE AUTHORIZATION BUDGET

Senator WIRTH. General Starry, can I ask you, if you were sitting where Senator Levin is sitting, how would you be altering the budget as we get into this reauthorization cycle for next year?

General STARRY. It seems to me that we are probably buying most of this equipment about as fast as we can given the current production rates. You are talking about the nearer term. The programs that are under way to fix the near-term problem, it seems to me, are reasonable, although most of us are frustrated with the rate at which that stuff is coming into the inventory.

We are on the threshold, I think, as we plan ahead, of having to make a decision in the tank or in the armored vehicle world about whether or not we are going to try to skip a generation, not only for the tank but for the infantry fighting vehicle and for the artillery as well. That decision is based on two events, two sets of facts. One has to do with whether or not the threat demands it and, second, does the technology allow it.

My judgment about those, of course, is the threat does demand it, and the technology does allow it. There will be a tendency to keep pushing for block MODs on what we have. I am not at all opposed to the block MODs that have been proposed, and, as General Pihl says, we should block those out and continue to work toward them. But at the same time, we need to look seriously at the question of whether or not we should not just say to ourselves, all right, we are not going to do the Bradley and the M1 beyond 1993 or 1994 or whatever it is, and at that point we will have fielded or designed and be in the process of fielding a new set of armored systems.

This is why the armored vehicle task force is so important. It is also why the Chief of Staff of the Army is convening another special task force starting in June of this year to look at this whole problem and develop for him an armor/anti-armor modernization plan as opposed to a master plan. It is a modernization plan designed to focus the resources, on the problems that are most urgent.

Obviously, as we have talked before, one of those problems is whether or not you can apply electromagnetic launch technology, whether it be electrothermal rail launch or coil guns or whatever, to the problems of increasing the velocity and expanding the battlespace and do that in a matter of, let us say, 4 or 5 years. There are those who claim you cannot do that. Some of us believe that you might if you tried hard enough, and it is in those areas where it seems to me if we want to, one, redress the balance and, two, establish a competitive modernization rate, we are going to have to take some chances. That happens to be one of the chances I would take.

Senator WIRTH. Finally, that demands a much more significant R&D effort than General Pihl has the money for doing, is that not right?

General STARRY. Well, it probably does, Senator Wirth. It does also require that you focus what you have more directly on the problem, which has happened here since these recommendations were returned to the Secretary of Defense almost 3 years ago. Now, as we have started a lot of things, the impression you get as you go around looking at what has been done and listening to the people talk about progress is that we have addressed ourselves to the problem on a front that is about a mile wide and a quarter of an inch deep, and it is time now to start eliminating some of those options, perhaps even just arbitrarily, but certainly eliminating the least promising of those options and focusing our resources, increasing the scarce resources, on the most urgent problems.

Senator WIRTH. Thank you, Mr. Chairman.

Senator LEVIN. I have just one comment.

As I understand your testimony, General Pihl, there are at least three things that you are saying we can very usefully do right now and not wait until next year's budget and maybe more. Those three things are continuing the production lines in the areas that you have identified; exploring the retrofit of the M1 with a 120 millimeter gun; and redistributing M1s to the Reserves rather than the M60s.

General PIHL. Yes, sir, that is correct.

Senator LEVIN. Then those are specific budget actions that we would take of which you would be very supportive of, to phrase it euphemistically; is that correct?

General PIHL. That is correct, Senator.

Senator LEVIN. General Starry, would you support that?

General STARRY. Yes, sir.

Senator LEVIN. If there is anything else in that area, specific actions that you want to at least support, you cannot, I guess, recommend them technically because you have your budget in here, but you can support them if we ask you, and we would welcome any additional comment that you have.

My plan now is to go into closed session unless there are additional questions from either Senator Cohen or Senator Wirth.

If not, what we will do is recess for about 3 minutes while we clear the room and go into closed session.

[Whereupon, at 3:45 p.m., the subcommittee proceeded in executive session.]

EXECUTIVE SESSION

The subcommittee met in executive session at 3:49 p.m. in room SR-222, Russell Senate Office Building, Senator Carl Levin (chairman) presiding.

Present: Senators Levin, Wirth, and Cohen.

Staff present: Romie L. Brownlee, deputy staff director for the minority; Andrew S. Effron, counsel; Richard D. Finn, Jr., John J. Hamre, professional staff members; Mickie Jan Wise, staff assistant.

Also present: Milton D. Beach, assistant to Senator Glenn; Robert K. Griffith, assistant to Senator Wirth; Terrence M. Lynch, assistant to Senator Shelby; Anthony H. Cordesman, assistant to Senator McCain.

Senator LEVIN. The room is cleared now. General Pihl, you apparently have a presentation that you are going to make. I know that Senator Cohen is going to have to leave in a few moments because we have a briefing from Secretary Shultz.

DEFENSE SCIENCE BOARD FINDINGS

General PIHL. Sir, we have narrowed the responses down to the things that we said we would clarify in closed session. General Starry wants to show two charts that will clarify the DSB findings and then we will talk specifically, without giving you a briefing, on your question.

General STARRY. We talked earlier about the bathtub of ignorance. Let me give you some balanced feel for what is going on. We reported to the Secretary of Defense on August 24, 1985. This is what the intelligence community, the Defense Intelligence Agency, predicted was in the bathtub at that time.

Now, if you go down this list and compare it to what we have, the same categories of things, it will be a much longer list, obviously, but the same categories of things. If you go up here (indicating), we have one tank improvement program under way. We have one attack helicopter being fielded, and we were working on issuing a request for proposal for one antitank guided missile system. That is

why I said the rate of modernization is a function of what volume is in that bathtub of ignorance at any given time. What you see here is the relentless march of that 5-year planning system on their side.

May I have the next slide, please.

[Slide deleted.]

Let me just use one other slide to show you, to tell you—no, put the other one on.

[Slide deleted.]

TANK ARMOR VULNERABILITY

You saw a chart like this before, but the scale there was relative penetration. [Deleted.]

So they are—8 to 10 years, [deleted]. I would emphasize to you that this is a phenomenon that was not at all unknown to the task force. We were quite aware of this. We were quite determined to prevent it from happening to us this time, and it happened again.

The [deleted].

Senator COHEN. What do you mean, "with their bosses?" What do you mean by that?

General STARRY. The relative problem that the Soviets have—the [deleted].

Two things have happened. [Deleted.]

As a matter of fact, [deleted].

General PIHL. [Deleted.]

General STARRY. [Deleted.]

Senator LEVIN. Before you leave that chart, why does the blue line end in 1988 or 1986?

General STARRY. Do you mean here?

ARMOR FORCE PROJECTION

Senator LEVIN. Yes. Why have you not projected that out the way you have the red line?

General STARRY. Well, you have TOW, I-TOW, TOW 2, and Hellfire. What we did not know at that time, what was coming next, and so it had to end there. As a matter of fact, one of the projections we made off of this, was the recommendation that I spoke about a while ago, [deleted].

[Deleted.] I think we need to investigate. And I think my colleagues here would agree with that. [Deleted.] The question is, are you going to be able to get through with the unitary warhead or not?

Senator LEVIN. I am a little confused by that chart. Maybe it is a very basic question and I am missing something. But if we act the way the Army plan proposes that we act, what happens to that blue line?

General STARRY. Well, let us see. [Deleted.] We will be about right here (indicating).

Senator LEVIN. That is if that plan of theirs is adopted?

General PIHL. Yes, sir.

Senator LEVIN. What about on the protection side?

General STARRY. [Deleted.]

General PIHL. Yes.

General STARRY. [Deleted] if I have that lined up right.

ARMOR AMMUNITION PROJECTION

Senator LEVIN. Does that assume their new missiles and bullets, too? Does that red line assume their new bullets?

General STARRY. Well, the problem with the red line in this case is down here, armor—[deleted]. The problem with the armor is this armor projection for [deleted].

Senator LEVIN. I am just wondering, how accurate is this chart?

General STARRY. [Deleted.]

Senator LEVIN. Our improvement that you just described puts us about the red line, [deleted] and then we have got to do something significantly better.

General PIHL. We have to shift to an overmatch weapon, like [deleted] yes, sir.

General STARRY. That gives you a catch-up. The question now is can we keep them going up at the upper level.

Senator LEVIN. In the upper part of that graph, again, if we act the way the Army has proposed, we can climb above that projected red line through 1995, is that what we think? Or are we just not certain?

Are we uncertain about the bullet [deleted] the red bullet on the top? Is that line, the one you are not certain about, could that be higher?

General STARRY. We are not certain about that.

Senator LEVIN. So that could be higher?

General STARRY. That is right.

Senator LEVIN. So even with the improvements the Army is hoping it will adopt, that blue line will jump, but it may not jump high enough to catch up?

General STARRY. Yes, sir.

Senator LEVIN. Let me interrupt both of you because I think my colleagues might have to leave and I want to give them a chance, if they have any questions, to ask them.

PROJECTION BASE LINE

Senator COHEN. Why do you not project the lines based on our past experience in terms of a quantum leap from where you thought they would be to where in fact they are and then use that as the base line to project where that red line is going to be?

I think that is what Senator Levin is getting at, and I will tell you why. I serve on the Intelligence Committee and you are not the first people to come in to talk to Members of Congress and say: You know something, we underestimated the Soviet Union.

Time after time, system after system, we are being made to look like fools because we said: Gee, we did not think they had that capability, and they have extraordinary capability.

They are devoting something between [deleted] percent, probably closer to [deleted] percent of their GNP, for their space programs and military programs, while the rest of the country is in a shambles.

And we keep coming in and saying that we were surprised on this one. So why not be surprised this time and take the red lines

and, based upon where you thought they would be and your past projections, and show what they have done between what we thought they would do and what they have in fact done, and then use that as your projection?

Why do we not do that?

General STARRY. Maybe because——

Senator COHEN. You do not want to scare the hell out of our allies? [Laughter.]

General STARRY. Maybe because of the phenomenon that we observed when we were trying to draw these lines in the first place. We get the good intelligence guys in there and they are making projections out of the bathtub of ignorance.

Senator COHEN. But now you are not ignorant. Now what you are saying is look, we have seen what their capability is here and we have now concluded that our estimates are far too conservative, and we have to stop coming in and saying we were surprised again and really paint a more realistic picture of what has happened.

Senator Levin is saying: Well, perhaps we will still be a little bit behind that line. And what you are telling me is, I think it is going to be a lot worse than that.

General SHOFFNER. Sir, I think your question is a very fair question. Let me tell you of some debates that have gone on in the past 4 months in the intelligence community in the Army. We have tried to go back and examine the Soviet RDA process, because I believe most developmental items can be predicted, that which goes into the acquisition phase that General Starry refers to.

If we will go back and pay more attention to the basic Soviet R&D process, the one advantage of it, as you know, is that you can predict it, and a lot of the process is open. We are trying to take a longer term view of the projection. Now, there is a lot of spread associated with taking a 20 year projection. I would also tell you that this problem is very difficult from a mathematical, engineering, and analytical standpoint, because it is complex.

[Slide deleted.]

ARMOR VULNERABILITY AND LETHALITY

The armor is complex and the kill mechanisms are complex. I have a chart that shows 17 ways to kill a tank. You can do it many different ways.

We put our first application of Cray computers to work on vulnerability and lethality issues, and that machine is running at about 87 percent capacity.

You are correct in what you are asserting, but I will tell you, we are still learning in many of these areas and we have gained. I think one of the aspects of the Defense Science Board that is a plus, is that we have some of the brightest physicists in the country in the national labs working with us now, helping to solve this very difficult, perplexing problem.

Senator COHEN. How long do you think, for example, it will take them to develop something comparable to the TOW 2?

General SHOFFNER. [Deleted.]

URANIUM ARMOR

Senator COHEN. What about the depleted uranium armor?

General SHOFFNER. There are at least two schools of thought on how one should make a long rod penetrator, and we have chosen one where the——

Senator COHEN. I am talking about armor, not the penetrator, the armor.

General SHOFFNER. Yes, sir. You are speaking of the armor per se.

Senator COHEN. Yes.

General SHOFFNER. I am sorry, sir, I mistook that.

General PIHL. At the present time, sir, the package that we just got into the tank will protect us [deleted]. We probably need to brief you separately on that, sir.

Senator COHEN. Well, there are some other things that are going on there, then.

General PIHL. Yes.

General STARRY. If I might say something about that. One of the interesting aspects of this whole thing is how quickly you can change the threat, particularly in the case of the boxes. I mean, it is a fairly simple solution. It suggests to you that you should probably not build all that much armor into the tank. Instead, you should armor the tank by building arrays of armor on the outside that are welded on or bolted on, so that as the threat changes you can change that armor array without having to rebuild the whole tank fleet.

The [deleted]. So they have built a basic armor envelope, onto which they are bolting or welding some pieces, an armor array which is tuned to defeat the threat.

That also tells us that in the armored family of vehicles program, as well as in whatever skip generation we elect to adopt if we elect to go that way, that is the way you have to go with your armor.

DEPLETED URANIUM TECHNOLOGY

Senator COHEN. Do we intend to share the technology in depleted uranium with our allies?

General PIHL. [Deleted] sir.

Senator COHEN. Would you recommend against it?

General PIHL. Sir, we need to really work that problem hard. [Deleted.]

Senator COHEN. Thank you, Mr. Chairman.

Senator LEVIN. Lest an opportunity go by for me to make this comment, the SDI request for this year is larger than the entire Army R&D budget.

General PIHL. Sir, under the blanket is [deleted].

Senator COHEN. I was wondering what was under there.

Senator LEVIN. You thought that was SDI over there, did you not?

Would you like a quick look before we go?

General PIHL. I will let Mr. Opat pull the blanket back. We will not give him time to brief you because he will take too long. Right, Henry?

Mr. OPAT. Yes, sir. The main feature of this, sir, is that with this mechanism we fire [deleted].

Senator COHEN. Is this the spike that goes in and sets off the explosive?

Mr. OPAT. No, sir. This is a long rod penetrator. It is quite a long one. [Deleted.]

[Deleted] which is what we are predicting for this system.

ARMOR TECHNOLOGY

Senator WIRTH. Can you put that same technology in a British tank or a German tank?

Mr. OPAT. Sir, you are talking about the chassis itself?

Senator WIRTH. No, right there, where you say [deleted].

Mr. OPAT. Yes, sir.

Senator WIRTH. Would that suggest that you would then move from there to [deleted].

General PIHL. Yes, sir.

Mr. OPAT. Absolutely.

Senator WIRTH. Are we sharing that with our allies?

Mr. OPAT. Yes, sir.

General PIHL. [Deleted] yes, sir.

Senator WIRTH. Are they doing the same sort of thing?

Mr. OPAT. Sir, we are in the process of negotiating an MOU with them. We have a technical agreement with the British and with the Germans on the [deleted].

We are now talking with the French to get the same technical agreement with them, which in essence says that if anybody is going to have interoperability, we are going to have interoperability of ammunition and we will all be able to fire this ammunition from the same gun. Each country could make their own ammunition, but it will be firable from this gun. So we will have assured interoperability. The formal MOU stage is under the SNR. The Army's SNR group is in the process of looking at establishing a formal MOU for the common development of this.

INTEROPERABILITY OF TANK AMMUNITION

Senator WIRTH. If you are here 4 years from now, will you be able to say to this committee, whoever is on it, that there is now complete interoperability of tank ammunition?

General PIHL. No, sir, not at the present time. It is obviously a goal. We have interoperability between the Germans and ourselves.

Senator WIRTH. You mean this whole thing may fall off the table, is that right?

General PIHL. No, sir, I do not think so. You said 4 years and I just wanted to speak to that.

Senator WIRTH. Well then, when? There is not a hard date. Just give me a number. I am just curious about the problem of interoperability. Is it in fact going to happen because of technology?

General PIHL. Sir, it is happening in our current guns. We have interoperable 105s, we have interoperable 120s, with the exception of the British.

Senator WIRTH. Are all of the new tanks being developed by the British, the Germans, the U.S., and so on, do they all have interoperable ammunition, if that is the terminology?

General PIHL. Being developed, yes, except for the Brits, sir.

Senator LEVIN. The Brits?

General PIHL. Yes, sir.

Senator WIRTH. I think you said that we have an MOU with the Brits.

General PIHL. We have an MOU on armor technology and are negotiating an MOU on the lightweight 120 gun. I want to be sure that what we are showing you here is one [deleted] that we are currently putting into the M1A1. This is an R&D proposition, sir, that we are showing you right now.

Senator WIRTH. But the Brits are building a tank that does not have interoperability?

General PIHL. They may build a tank, sir. Right now they have a real issue facing them in terms of what their future tank is going to be.

General STARRY. The British historically have been hung up on rifle guns, and it is a cultural thing.

General PIHL. We have gone to the smooth bore.

General STARRY. The Germans and ourselves have gone to smooth bore.

General PIHL. Mr. Opat, by the way, sir, is one of our talented engineers out of Picatinny Arsenal. I just thought this would be of interest to the committee. And thank you, Henry.

TANK BLOCK III IMPROVEMENT

Senator LEVIN. On that point, is that part of the Block III improvement?

General PIHL. Sir, you could do that as sort of a Block III proposition, yes, sir, you sure could.

Senator WIRTH. Are the Germans undertaking the equivalent of a Block III modernization as well?

General PIHL. They are at Leopard 2 right now, sir, and they are looking at another block mod to their Leo, yes, sir, they are. Whether or not it is as full as Block III or not——

Senator WIRTH. Will that have in it the equivalent of this?

General PIHL. As I say, that depends on us finishing our negotiations with them.

Senator LEVIN. But we are offering it to them. We are urging them to do this jointly or interoperably.

General PIHL. We would like for them to join us in this project, yes, sir.

Senator WIRTH. What is the problem with their doing it? Why do they not say yes?

General PIHL. I do not believe we have gotten to that level, even in our own R&D, to offer it, sir.

Senator LEVIN. Well, what would be the impediments? Might they want something different? Might they want to do it themselves? Might they not want to share technology for this?

What would be the impediments? It looks so obvious to us. Why would not the rest of our allies just grab it? Or are you saying it is likely that they will, that it will be interoperable?

General PIHL. I think we will have an interoperable capability, sir. We will probably build gun tubes in both countries.

Senator LEVIN. How confident are you that we will have an interoperable capability in this? 80 percent? 60 percent?

General PIHL. Yes, sir, I am reasonably confident that we can do that.

Senator WIRTH. When will this be in the theater?

General PIHL. [Deleted.]

Senator WIRTH. So in the mid-1990s, realistically the year 2000, is the first time that you are sure that we would have largely interoperable ammunition, is that correct?

General PIHL. No, sir. We have interoperable ammunition now in the 105 caliber and the 120 rounds between ourselves and the Germans. As we pursue this gun, we also want it to be interoperable.

INTEROPERABLE AMMUNITION

Senator WIRTH. [Deleted.]

General PIHL. [Deleted.]

We have the capability not to do the [deleted]. But we need to continue to do this upgrade, continuous modernization of the process, to stay ahead.

General SHOFFNER. Senator Levin, if I may go back to answer your question of why do the allies not respond, part of our problem in this is an understanding, an in-depth understanding of the specific capability of the threat. We have a lot of technical information that is shared on the ballistics, on the nature of the threat, on the definition of range targets, and the performance of weapons.

That is a fairly large piece that we carry along. In many cases they are completely up with us on what we are doing. In some cases, in some of the more advanced materiels work, we have not shared that or they have not shared it with us.

So this business of a good and competent exploitation program is part of the necessary ground work to convince them that there is a problem that needs to be dealt with. I think we are making progress in that, but it is an area that continues and demands effort.

It may be one of the reasons why our own institution was slow to respond to the threat until it had a better definition and appreciation and was convinced that specific threats really would in fact materialize, because the response requires a great deal of resources.

I think that is part of our problem in the allied response not being as prompt as we would like it to be.

Senator LEVIN. Let me go back to the question of how long it will take us to get this kind of gun in our tank. You are saying 1995. That means if we were able to add funds to this budget cycle in 1989, to the R&D on that, that that would be about a 7 year period. Is that about right?

General PIHL. (Nods affirmatively.)

Senator LEVIN. That could get from R&D first funding into deploying in the field in about 7 years?

General PIHL. Yes, sir.

M1 TANK

Senator LEVIN. What is going to happen to the weight of the M1 tank with all of these new mods and the new armor?

General PIHL. Sir, first of all, we have limited the tank to 70 tons as an absolute. It will not grow bigger than that. That keeps us in sync with our heavy equipment transporter and the recovery vehicle. We will continue to trade weight and capability. General Shoffner and I personally agreed that we will draw a very hard line on that, to keep the tank down in the 67-, 68-ton weight class. So the block improvements have to pay for themselves in terms of weight budget in the tank to keep it constrained.

Senator LEVIN. Do you feel you are going to be able to do that?

General PIHL. Yes, sir, I do.

Senator LEVIN. Senator Wirth, do you have any more questions?

AMMUNITION UPGRADE

Senator WIRTH. Are you confident that as we are upgrading our ammunition to be able to cope with what is an increased Soviet defensive capability, that as we are doing that the Germans and the Brits are doing that, too?

General PIHL. They have similar programs going on in their kinetic energy systems, sir. They need to work as hard in the chemical energy area.

Senator WIRTH. And they are not doing that now?

General PIHL. To my knowledge, in the improvements to MILAN and HOT and Swingfire and their current systems, they do not have the same vigor in the CE (chemical energy) programs that they do in KE (kinetic energy).

General SHOFFNER. I have recently sent letters to each of the attachés inviting them to participate with us in the chemical energy test fire programs which are ongoing now. I know they have received the letters. I think they will respond but that is part of the continuing dialogue so that we understand the threat through the same lens.

Senator WIRTH. Presumably, in at least two ways, we are as dependent upon them as we are on our own capability, right? Both in terms of the fronts that they have and the fact that our supply lines run behind them.

Now, we have talked predominantly about the Germans and the British. What about the Dutch and the Belgians? Where are they? Are we not also dependent upon the capability of the Dutch and the Belgians?

General PIHL. We are, sir. But in the tank arena, they tend to be customers of the Germans.

Senator WIRTH. So the Dutch and the Belgians tend to buy the German tanks?

General PIHL. They buy the Leopard, yes, sir.

Senator WIRTH. And the Germans—you believe that the Germans are upgrading as we are upgrading, although they are not

doing as much as they should be doing in the chemical area, but we are pushing them to do more in the chemical area, is that right?

General PIHL. That is correct.

Senator WIRTH. Again, I am not sure what the impediments are. But if we see a sense of urgency in this, why do they not see the same sense of urgency and therefore move ahead? Or are we seeing ghosts where they are seeing clearly lit shapes in the moonlight?

General SHOFFNER. Sir, I am saying that we are working very hard to make sure that we see the same solid perspective of the threat, and that is down to the level of the technical performance characteristics of the threat as well.

Senator WIRTH. What does that mean, General? Does that mean you see the threat in the same way?

General SHOFFNER. Well, there are a couple of ways. First of all, there are the individual items of equipment and their performance capabilities which is part of it. That is what much of the discussion has been about today.

The second is how he will choose to use the equipment or how he fights, and that goes beyond the close battle where the forces join, as well as the broader context of the battlefield. That, in my view, is a very key piece of looking at the total battlefield. We have agreement with the British and the Germans on how that will go together. I think the work that is going on in NATO on the Follow-on Forces Attack (FOFA) is a key piece of gaining the right operational level perspective of the fight.

Senator WIRTH. Let me ask the question this way. Have we had a lot of what we think is very good intelligence on Soviet anti-armor?

General PIHL. Yes.

Senator WIRTH. Have we shared that with the British and the Germans?

General PIHL. Yes, sir, we have.

General SHOFFNER. Yes, sir.

Senator WIRTH. All of it?

General PIHL. I do not know.

INTELLIGENCE TECHNOLOGY

Senator WIRTH. I am just wondering. I do not understand. If we have this intelligence and very clear understanding of the threat and we share intelligence with them and all of our sense of the threat is shared with them, and they are not responding as we are responding, maybe I am misunderstanding you.

But I do not understand how that could be the case. If we have this intelligence and perceive the threat is going to here (indicating), and they have the same intelligence and maybe they do not perceive that the threat has gone up, is that right?

Why are they not responding?

Generaly STARRY. [Deleted.]

They do not at all disagree with what we have found. The estimates that have come out of our test firing and so on are not at all unlike their own conclusions. They have not done test firings. But I came away from both of those conversations convinced of two things. One, they did not disagree with the threat assessment; two,

they were much more concerned about it, about what to do about it to redress the imbalance, and much more concerned about doing something in the immediate future than perhaps even we are.

They have a funding problem in both of those countries, and so what you find them doing is focusing their resources very carefully on the things that they think are going to yield the biggest return.

In the U.K., for example, they have got most of their R&D work going into [deleted] because they see that as the way to go in the next generation of vehicles. They are also working on guns, but you can see them focusing on the thing that they think is the next generation, which is the [deleted].

And the Germans are doing the same thing. There is some good but limited work going on in both of those countries in the chemical energy warhead world that is not nearly as extensive, I guess is the right word, as is ours. So I think they are seized with the threat. I found really no—you know, a millimeter or two disagreement here and there is manageable.

But I found no disagreement, no basic disagreement between what I told both the Chiefs of Staff and what they knew from their own people. So whether or not we share it, they get the information.

They get upset with us because we close the colored doors with them and will not share it with them sometimes, but they have got the information. It is every bit as good as ours.

Senator WIRTH. One final question on that, Mr. Chairman. There is a gap over the next decade. That gap is going to be filled with chemical launched, is that right?

General STARRY. Well, it has to be filled with improvements for at least the foreseeable future, what, 5 or 6 years, it has to be filled with improvements in the existing systems. There is no way to technically leap ahead in the matter of 4 or 5 years.

Senator WIRTH. What you are telling me is we are really concentrating on doing those improvements to a much greater extent than either the British or the Germans are, is that right?

General STARRY. We are spending money on more things than they are. They have taken a risk. It may be that the things they have focused on are not going to pan out.

General SHOFFNER. Let me make a point if I may, sir.

[Slide deleted.]

This slide shows the set of programs that we are working. [Deleted.]

Hellfire and Copperhead are the fielded systems which can [deleted] the antitank version; wide area mines, which have an expanded sensor, will generally be [deleted] as well as terminally guided weapons in the category of smart weapons, some of the other deep systems, and then the mines which attack the bottom of the tank.

So as we go forward, we hope to present the Soviet tank several ways that it can be defeated. These programs are well under way in various stages of development. The TOW 2B will use the basic investment that we have already made in TOW launchers. The gunner will essentially shoot the same, except, instead of attacking the front with a chemical energy warhead the missile will [deleted].

As we move forward, I will tell you that we will bring forward a set of weapons with which to attack the Soviet, so that we do not have a single failure mode.

INTERIM ANTI-TANK WEAPON

Senator LEVIN. While you have that subject in front of us, let me just comment on what the House Armed Services Committee has directed the Secretary of the Army to do in this area. It is to select an interim anti-tank weapon from among the MILAN II, the BOFORS BILL, and the Dragon 3, and the selection is supposed to be done on the basis of all operational testing and evaluation as of June 1, 1989.

Can you tell me the Army's view of this legislation?

General PIHL. Sir, we have completed the test on the MILAN. We are underway on the test of the BOFORS BILL. We would like to test the Dragon generation three, and we agree that for certain threats, for certain of our forces, we do need some capability in this area. But we would like to product improve the Dragon to a level two warhead and then go directly to the advanced antitank weapons system medium, one of the technologies that is keyed to keeping our light forces armed.

[Additional information follows:]

FIBER OPTIC GUIDED-MISSILE (FOG–M)

The Army's Fiber Optic Guided-Missile (FOG–M) is in development to perform the Non-Line of Sight (NLOS) mission for the Forward Area Air Defense System (FAADS). The Army program manager is ensuring that the FOG–M in development for NLOS will also meet or exceed the requirements for the Advanced Antitank Weapon System-Heavy (AAWS–H).

In fiscal year 1988, the Army will begin the proof of principle testing of the 10 kilometer range, television seeker missile fired from High Mobility Multipurpose Wheeled Vehicle (HMMWV) launchers. The testing, called Initial Operational Evaluation (IOE), will be finished in March 1989. The beginning of the Full Scale Development (FSD) of the advanced system (extended range, high/variable speed missile, improved navigation, more lethal warhead and a seeker capable of day/night/adverse weather operation) will also begin in fiscal year 1988. The Request for Proposal (RFP) was released to industry in November 1987. Responses to the RFP are due to the Army by April 29, 1988. The decision reviews for the Milestone II FSD goahead are scheduled to be complete in July, 1988. Contract award will be in August.

The fiscal year 1989 budget request for NLOS FOG–M is $114.5 million. The fiscal year 1989 plan provides for the FSD effort of a prime contractor team, completion of the IOE, issuing the IOE hardware to an Army troop unit at Fort Bliss for doctrine, tactics, and techniques experience, and for Technical Risk Reduction (TRR) work to be performed by the Research, Development, and Engineering Center (RDEC) at Redstone Arsenal, Alabama. The TRR program will provide the Army alternative hardware components that meet the advanced system requirements, provide engineering expertise to help solve development problems that are encountered by the prime team, and will provide alternative vendors for components that may introduce greater competition to the FSD phase. Current cost estimates show that an additional $30 million is required to complete all of these actions and the Army is looking for a source for these funds.

Low Rate Initial Production (LRIP) will begin in fiscal year 1991 to field the first unit in fiscal year 1992. Advance procurement funds will be requested for fiscal year 1990 to support the LRIP effort.

Senator LEVIN. In other words, you would oppose that requirement?

General PIHL. Yes, sir. We would like to be free to pick the missile system that we need, which right now for the near term is a GEN II mod of the Dragon, and in the far term is the AASW–M.

Senator LEVIN. What you have just said, is that unclassified?

General PIHL. Yes.

Senator LEVIN. Can we put that in the unclassified portion of this record?

General PIHL. Yes, sir, that is unclassified.

Senator LEVIN. General Pihl and General Shoffner, your joint prepared statement will be made a part of the hearing record.

[The prepared joint statement by General Pihl and General Shoffner follows:]

PREPARED JOINT STATEMENT OF GENERAL PIHL AND GENERAL SHOFFNER

Good afternoon Mr. Chairman and members of the committee. It is a pleasure for us to appear before your committee to discuss Armor Anti-Armor. It is also a pleasure to rejoin a mutual mentor, General Starry. Much of the doctrine in our Army stems from General Starry's work to change the future of land warfare when he served as Commanding General of the Training and Doctrine Command.

A3 is not a new subject area for the Army. In the past it was sometimes addressed as separate components, that is, tanks and antitank weapons. The relationship between the two has been called the tank-antitank equation. But that carried in it the idea that tanks in any Army were basically the same—large caliber gun carrying weapons systems protected by homogeneous steel, and antitank weapons were rockets, grenades and guns designed to damage or defeat these solid steel tanks. Since the start of World War II, there has been an evolving competition between opposing alliances to gain and maintain advantage in the tank-antitank equation. Advances in technology have caused that evolution to broaden the tank-antitank equation into what we call Armor Anti-Armor because what is changing now is not so much the thickness of the steel and the caliber of the gun but the form and composition of the tank itself. Applications of composites, laminates, ceramics and metallurgical techniques and advances in other protection technologies have signaled a change in the nature of the tank. As a result, the technologies of antitank weapons must also change. Thus, today A3 must address "armor" both as a technology and a tactical concept, and Anti-Armor, which includes everything designed to defeat armor. A3 includes a number of systems, components and techniques, and doctrine, that cross all traditional Army mission and functional areas. Armor includes tanks, infantry fighting vehicles and other protection enhancements such as smoke, obscurants, electronic counter measures, low observable technology, signature reduction and mobility. Anti-Armor capabilities include artillery, ground combat vehicles, mine warfare, Army aviation and close air support, coupled with recently developed target acquisition technology.

The modern battlefield that hosts NATO and Warsaw Pact battles will be a three dimensional atmosphere highly charged with vast numbers of lethal munitions delivered twenty-four hours a day. It will require highly mobile, destructive, and survivable systems for armies to achieve their goals. The modern tank, with its matched infantry vehicles, will be the major force on that battlefield. The antitank systems opposing that force will be equally important.

Over the past decade the U.S. Army, with the support and assistance of the Congress, has pursued the largest peacetime modernization program in our history. We have dramatically increased our warfighting capabilities. During the same period the Soviets have been engaged in an even more aggressive modernization effort. In comparison to what we have fielded, they have turned out almost nine times as many artillery pieces, five times as many surface-to-air missiles, over three times the number of tanks and twice as many helicopters. While this has resulted in even further increases in their numerical superiority, they, more importantly, have reduced and in some cases reversed the qualitative advantage we held. It is clear that in the Armor Anti-Armor arena we are now behind. It is equally clear that we must not just catch up but must regain the lead and then maintain a technological advantage.

The Defense Science Board, which General Starry co-chaired with Dr. Braddock in 1985, made a valuable contribution. They predicted that the Soviets would [deleted] and they said the USSR would likely increase their historical numerical advantage by maintaining their substantially higher modernization rates.

We were not surprised by these developments. For some time now we have been pursuing technologies to counter exactly the threats we now see the Soviets developing and fielding. Much of the early work has been accomplished and the manage-

ment structure is in place to execute the programs. What is needed now is adequate resources to deal with our shortfall in meeting the requirements.

A net assessment of the armor Anti-Armor problem was recently completed by the Army. It was done by a team drawn together from the Army staff, field agencies, the Training and Doctrine Command and the Army Materiel Command. The assessment was ordered by the Chief of Staff because several significant events concerning the threat occurred from late 1986 to mid-1987; those occurring in mid-1987 being particularly noteworthy. [Deleted.] Because of the potentially wide impact of these threat events, the A3 Net Assessment Team examined their possible effects on our materiel, training, doctrine and organizations.

The net assessment began with an examination of Soviet tank armor protection. The basic heavy armors in modern Soviet tanks are laminates and laminates with ceramic inserts within steel. This base armor improvement was the first step in Soviet armor modernization beginning in the late 1960s. It is now a feature of the T72M1, T64B. T80 [deleted] tanks in WTVD.

Reactive armor is applied as an applique over these laminated base armors. Each tank receives a set of individual boxes, each contiguously applied, usually on the front of the turret and upper hull glacis on the tank. A reactive armor box is made of sheet metal and [deleted]. When a jet of metal, in a plastic like state, created by the detonation of a shaped charge warhead, penetrates the outer surface of the box, [deleted] sending the flyer plates into motion. The outward movement of these plates disrupts the jet. As a result, [deleted].

[Deleted.] It is clear now that Soviet armor improvements in recent years were most likely made in reaction to the extensive NATO antitank guided missiles deployment begun in the 1970's. This is then not so much a technological jump ahead of the West, but is instead an attempt by the Soviets to get out of the hole they perceived that the west had dug for them. Although reactive armor is not a new technology, it is effective and represents good applied engineering and research. When attached to the improved base armor of the tanks tested above, the combination provides [deleted].

The effects of this new combination were compiled in the A3 Net Assessment. It was found [deleted].

The modern battlefield on which these improved armor tanks will appear is going to be, as described above, lethal and fast paced. Soviet doctrine calls for massed attacks by concentrated tank led forces coming in successive echelons. These attacks will be supported by massive Soviet artillery bombardments that will alone create much damage. This abundance of artillery, joined with the fire of armor and anti-armor systems outnumbering NATO's by at least two to one, will make very difficult the warfighting tasks of our forces. As a result battles will be decided largely at the front line as first echelon forces close with friendly forces. The close battle takes place from the FLOT out to a distance of six to ten kilometers beyond the FLOT. It is in the close battle where winners and losers are determined. The Soviets, through their armor modernization program, hope to improve their chances for winning this battle and winning it quickly.

The Soviets want to achieve and sustain, at the point of main attack, the combat power that gives them an advantage of five times over the defender. They attempt to reach this level of combat power through a combination of fires and maneuver systems. This is one of the major reasons they have invested heavily in self-propelled artillery. It is also one of the main reasons that the Soviet tank production exceeds that of the U.S. by about four or five to one. So, their principal challenge is to generate and sustain overwhelming combat power at the point of main attack and that makes both their close battle and deep battle forces very important. In fact, the forces following at 50–100 kilometers and the control of artillery fires are critical to their operational success.

To defeat them, our challenge is to deal effectively with their lead armies. There are two parts to this. First, we must win the armor anti-armor fight—where the forces close on each other and the tactical battle is joined—for that is where winners and losers are determined. Secondly, we must deal simultaneously with the Soviet ability to generate and sustain combat power at the point of attack. Corps and division commanders fight this battle against their follow-on forces. Close operations, conducted by brigade and battalion task force commanders, fix the Soviets, destroying their forces—thus denying the breakthrough they want.

The success of the lead echelons is critical to the overall outcome. If the lead echelons are able to achieve the early tactical success, then that success can be exploited by high tempo conventional operations. It is significant to note that restationing of Pact forces in WTVD have placed [deleted]. Successful breakthrough operations and

rapid exploitation are necessary to success of high speed operations to achieve the theater strategic objectives.

The strategic implications are plain. In Soviet developed theater strategic operations the objective is to seize the initiative before NATO is fully deployed and to conduct high speed offensive conventional operations characterized by deep penetration of NATO's defense. This is to be done in the first few days of the war to minimize the likelihood of transition to nuclear war. They want to fight the first stages of a war as though they had "uninvented" nuclear weapons. Using the Soviet method to examine NATO nuclear release procedures as one would expect the Soviets to do, they would perceive that they may have at least 120–192 hours (five to eight days) to advance before being confronted with a NATO decision to use nuclear weapons on the battlefield. They may see this as a nuclear free opportunity. This estimate is consistent with their operational norm of gaining 100 kilometers per day for offensive advances. If successful, this would put them near the German-French border in eight days. Unabated fielding of modern, capable, combined arms forces, along with substantial improvements in other conventional systems, improves their confidence that such a plan can be executed. [Deleted.] While the proposed INF Treaty may have some influence on Soviet planning, the Red Army imperatives to gain ground in battle before the NATO decision to use any nuclear weapons is reached have long been a matter of record. Upgraded armor is an enhancement to Soviet/Warsaw Pact conventional capability that was strong in numbers—and is now being improved in quality.

The Army has taken actions to mark the way ahead. First, because this Soviet program creates some battlefield realities that we must prepare to face now—so that we maintain our readiness—A3 training must be adjusted. The Army has been moving on this and is very close to publishing some material that will help commanders adjust their training—although they've already been alerted and are very much aware of what's going on.

The Army emphasizes fighting as a combined arms team. The combined arms approach to battle requires integration of all forms of weapons—infantry, armor, artillery, aviation. When we meet the attacker we want to present him with several different ways he will die, and we want to do it all at once. We teach and train our commanders to do that. Further, our commanders have the opportunity to train in modifying the operating environment of the battlefield to enhance the effectiveness of the combined arms team—with mines, barriers, smoke, and electronic warfare.

Today, just as in World War II, a tank can be killed in many ways. You'll recall that in the wake of the 1973 Middle East War, early Israeli armor losses prompted the popular notion that the tank had been rendered obsolete by comparatively cheap anti-tank missiles. The solution, as the Israelis re-learned, was for supporting infantry to accompany tanks and deal directly with the anti-tank weapons, and for artillery to saturate hiding positions, killing exposed soldiers, before the tanks came within range of the anti-tank weapons. These are the kinds of operations our soldiers are trained to conduct.

In war fighting, we want to concentrate on the enemy a confusing, violent, simultaneous attack by many means—death from several directions. In any future encounter with Soviet armies, we will engage tanks and kill them in many ways. Let's talk about attacking at depth first. [Deleted.]

We're going to kill forces attacking in the close-in fight with a combined arms team. This battle will be swift, violent, complex, and very lethal. Tanks will be destroyed by precision munitions launched by artillery and from helicopters and close air support aircraft. Tanks will be destroyed by fire from tank guns, and when crossing minefields. They will be stopped by barriers. They will be targeted by our technically advanced thermal sights. They will be hit with a swarm of anti-tank missiles. All of these means of killing tanks will be employed all together at once. By presenting the enemy with many ways to die, we create for him an incredibly complex and lethal problem that defies any single, easy solution. Similarly, if any one element of our force fails, the entire forces is not placed at risk.

In materiel, the armament enhancement initiative (AEI) must be kept strong as a program. There are some very good munitions in AEI that will serve the Army's A3 plans in the near term. They will be more lethal. The Army will continue to drive our intelligence analysts and scientists to get everything we can from exploiting the active armor and other sources available to us.

Management—this has all got to be controlled and managed very closely by someone with no other distractions. This will take serious concentration—concentration of both mental powers and good people. To do this we're organizing a Special Task Force (STF) to work on this for one year. Orders have gone out to select a group of officers now in the field to come to Washington to work on this. They will be headed

by the present commander of the 11th Armored Cavalry Regiment in Germany—Colonel Tom White. Colonel White is not only a very experienced leader of soldiers but also has some experience in investigating similar topics and is well prepared for this. He is technically and tactically competent as well as being a first-class, hard-nosed operations research and systems analyst. The A3 STF will, working directly for the Chief of Staff, work out the research, developmental, and programs corrections necessary to surge our A3 efforts. At the end of a year they will also have laid out the far term strategy required to keep our A3 efforts up to or in front of the Soviets.

While the Special Task Force will attempt to focus our overall effort, we are not waiting to begin to address A3 in a consolidated fashion much as we did aviation. We have identified all the funding contained in the FY89 budget submission for A3, some $5 billion of combined Procurement and RDTE dollars. This figure will serve as our base case and this block will be treated as an entity for planning purposes.

Having surveyed the current funding for A3 and armed with the knowledge gained from completion of the recent Aviation Modernization Plan, we can project an Armor Anti-Armor Plan. While this plan is not yet complete, I want to inform you of various options that are being considered for inclusion. The A3 Master Plan will examine the feasibility of continuing the current tank, fighting vehicle and tank killer production lines. It will examine the possibility of providing Reserve components with M1 tanks; it looks at upgrading the existing 105mm M1's to 120mm guns, and current anti-armor munitions and systems.

For fiscal year 1989, the funds contained in the amended budget submission will support, to an acceptable level, our immediate procurement goals for A3 programs. We will procure 545 M1A1 tanks, which effectively continues multi-year procurement efficiencies, maintains two tank plants and supports our modernization plans.

The companion to the M1, the Bradley Fighting Vehicle, has faired even better. Improvements under the Bradley Survivability Program are being put into production in May of this year; thus all 581 Bradleys procured with fiscal year 1989 funds will be the latest enhanced survivability models. Additionally, while it had looked like Bradley production would cease after the fiscal year 1991 funded delivery period, the restructured program will extend procurement to at least fiscal year 1994.

Funding for 72 AH–64 Apaches in fiscal year 1989 is a major change from our previous aviation procurement plans. In addition to this new procurement, the budget also contains $94.8M to develop upgrades to the Apaches to include an improved fire control system, integration of the Airborne Adverse Weather Weapon System, improvements to the night vision/target designation system, and signature reduction.

This year we are continuing to procure TOW 2A, which features a precursor charge to provide an enhanced capability against reactive armor, while proceeding with the development of TOW 2B. The fiscal year 1989 amended budget submission contains funding for an additional 12,000 TOW 2A missiles and continues TOW 2B development. We also plan to procure 5,000 Hellfire missiles in both fiscal year 1988 and fiscal year 1989. Additionally, we will spend some $400M on anti-armor ammunition, principally 120mm tank main gun rounds in fiscal year 1989.

Our A3 Research and Development programs are in two primary categories. First are product improvements to existing weapons, both TOW and Hellfire improvement programs are included. The development of [deleted], thus significantly increasing its lethality against future threat systems, is in progress. Current plans call for an initial operational capability in [deleted]. This year we will initiate a [deleted] additionally we are [deleted]. Collectively these improvements will enable Hellfire to [deleted].

The second category of R&D programs is our developmental systems; here we are working on improved ammunition, new missiles and new guns, both conventional cannon and electric guns.

Our Armament Enhancement Initiative program includes initiatives to accelerate supporting technical exploration, advanced development, and full scale engineering development of four projects which will provide a major increase in our armor defeating capability. Included are improved [deleted].

The [deleted].

Additionally, [deleted].

The Advanced Anti-Tank Weapon System—Medium (AAWS–M) is being developed to replace the Dragon. It will be a manportable weapon system capable of [deleted]. Current plans call for a DOD Decision Review and award of a Full Scale Development contract in March 1989, with [deleted]. The fiscal year 1989 amended budget submission contains over $100M for R&D on this program.

The Advanced Anti-Tank Weapon System—Heavy (AAWS-H) will replace TOW as the Army's principal antitank guided missile. The program will potentially consist of the [deleted]. The AAWS-H will provide increased [deleted] then the current TOW.

In the area of Hypervelocity Missiles, we are involved in a tri-service development program with the Air Force and the Marine Corps. This is the third year of a 3 year program. Planned testing is scheduled to be completed in August 1988. The current objectives are to [deleted] one for the Air Force and one for the Army/Marine Corps, and to demonstrate a kinetic energy kill mechanism that cannot be defeated by any known or projected Soviet armor. Following successful demonstration, efforts will center on developing an adequate fire control system and integrating a minimum smoke motor prior to entering full scale development.

Leaving missiles, there are several gun programs which have tremendous potential. [Deleted.] The fire control effort consists of making those changes necessary to incorporate the new gun, ammunition and autoloader.

Of potentially even greater benefit are the electromagnetic and electrothermal guns currently in research in programs in conjunction with DARPA. Electromagnetic launchers employ electrical pulses to create magnetic fields to accelerate advanced projectiles. Under Phase I of the program, which is currently underway, laboratory power supplies and guns are being developed and demonstrated. These consist of 9 mega joule skid-mounted railguns and 9 mega joule skid-mounted coil guns. A technical downselect between competing technologies is scheduled for late 1990. Phase II of the program consists of a 15 mega joule mobile demonstration.

Electrothermal launchers employ a large shaped electrical pulse fed into the breech. The electrical energy is converted into a plasma in a cartridge in the breech which is used to vaporize fluid in the chamber; the high pressure gas then propels the projectile down the gun tube. A joint SDIO/Army 9 mega joule lab gun effort has just begun. This project has been proposed to the Balanced Technology Initiative (BTI) for additional funding to enable us to assess the technology on an equivalent basis to railguns and coilguns.

These systems and projects we have discussed are the highlights of our A3 program. While there is much work to be done, we have aggressive plans and require only sufficient resources to bring them to fruition. The Congress has been supportive of our efforts to date, we thank you for that support. We need your continued support to provide the resources to deal with our shortfall in meeting the A3 requirement. With stable funding and effective management by the Army, in cooperation with the Congress, we can regain and maintain the technological advantage in armor/anti-armor.

With your help and support, we will provide our Army with what is needed for it to continue to serve as a viable deterrent and to be ready should it be called upon to protect this Nation's vital interests.

Gentlemen, we are ready for your questions.

Senator LEVIN. We have to go vote. We may have some other questions. Thank you all. You have been terrific.

[Questions for the hearing record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JOHN GLENN

A-10 REPLACEMENT

Senator GLENN. General Pihl, one of the most important anti-armor resources is the anti-armor capability of the Air Forces close air support (CAS) aircraft. What specific anti-armor requirements (e.g. lethality, response time, all-weather capability, etc.) has the Army provided the Air Force as they consider the selection of a replacement for the A-10?

General PIHL. A Mission Requirements Package was jointly prepared by the Army and Air Force to provide a detailed data base of design, missions, aircraft force structure and capabilities. The Army requirements were provided in the context of AirLand Battle doctrine—the battlefield environment, how we plan to fight and what we expect of CAS. The future aircraft requirements were derived from analysis of improvements to A-10 capabilities when applied to AirLand Battle requirements. Lethality requirements were generated through target sets which included the advanced armors for Soviet mid-1990s tank options. Response time is a function of the type of sortie—preplanned or immediate—and where we are in generating sorties. This was translated for the CAS platform into being able to taxi, within 5 minutes of "pilot on the ladder" for ground alert; "hot" rearm and

refuel in less than 25 minutes; loiter time dependant on mission radius; capabilities for day, night and under weather; dedicated ground and air interface; and interoperability with both Army aircraft and target designation systems.

JOINT STARS DEVELOPMENT PROGRAM

Senator GLENN. General Pihl, the Army has stated that the AirLand Battle doctrine is the rationale that guides the Army in how it fights; further, that a key element in implementing the doctrine is the Army and Air Force Joint Surveillance and Target Attack Radar System (Joint STARS).

I understand that the Joint STARS development program is continuing to have problems. I would like to hear your assessment of the status of the Joint STARS program and if you believe it will ever adequately meet the Army's combat requirements for detecting, tracking and attacking moving and stationary targets beyond the forward lines.

General PIHL. When the Joint STARS system is fielded to operational commands, it will meet the Army's wide area surveillance radar requirements for detecting, tracking and attacking moving and stationary targets beyond the forward lines. The program has experienced slips. The Army supports the Air Force requirement for additional time to complete the E-8A development. The restructured Joint STARS program will achieve the design goal which will meet the services' requirements. The Army, Air Force, JCS, and Department of Defense remain committed to production and fielding of a Joint STARS force structure that provides the Commanders in Chief a robust surveillance and deterrent capability.

QUESTIONS SUBMITTED BY SENATOR DAN QUAYLE

HYPERVELOCITY MISSILE

Senator QUAYLE. Is the hypervelocity missile program adequately funded?

General PIHL. Yes, it is adequately funded as a technology development program. However, if it is to be rapidly integrated into a weapons system, the program would require additional funding.

Senator QUAYLE. Can it be accelerated? Should it be? What would it cost?

General PIHL. Yes, the program can be accelerated by increasing the level of effort in our technology base work and simultaneously starting work on the components that would be needed to weaponize the technology. The potential of this technology to overmatch the threat makes it imperative to accelerate the program. The cost for accelerating the program will be $40M. This amount will cover a proposed increment to the AAWS-H program dedicated to HVM development. It will cover such items as risk reduction programs, design of KEM interface, smokeless motor integration, and work on fire control.

UNITED STATES VERSUS SOVIET SPENDING

Senator QUAYLE. I believe you have indicated that we have about $5 billion committed to the armor/anti-armor effort. In terms of fielding new technologies and rates of modernization, the Soviets must be spending enormous amounts. Are we spending enough?

General PIHL. We are satisfied that the $5.15 billion in funding we have requested in fiscal year 1989 for armor/anti-armor will meet our immediate needs. We will need additional funding in the future, however, if we are to sustain the current level of effort in terms of production of the M1A1 Tank, Bradley, Apache Helicopter, TOW, and Hellfire Missiles, and at the same time correct our existing armor/anti-armor deficiencies. Our current estimate is that an additional investment of $1-2 billion per year of level funding will be required. We are working with the Office of the Secretary of Defense toward this goal.

Senator QUAYLE. I believe you have indicated that we have about $5 billion committed to the armor/anti-armor effort. In terms of fielding new technologies and rates of modernization, the Soviets must be spending enormous amounts. Do we have any idea how much they are spending?

General PIHL. As you are aware, the Soviets treat information about their defense spending as a "state secret." There is little open press or classified reporting which would give us highly reliable figures. However, intelligence analysis of the various facilities' production outputs, relative costs of production, costs of raw materials, average laborer's wage scale, and the level of Soviet RDT&E enables us to roughly estimate annual Soviet expenditures on armor/anti-armor. It is at least [deleted] per

year. This figure includes the costs of RDT&E for all armored combat vehicles and attack helicopters. It includes procurement costs for those systems as well as their tank ammunition and anti-tank missiles. It also includes a modest figure for the costs of sustaining tank retrofit facilities.

This figure excludes operations, maintenance, and personnel costs normally attributable to unit training and readiness. It also excludes the cost of building and maintaining unit facilities (such as the regimental training areas). There is one important caveat to this [deleted] dollar figure: It is calculated using Soviet costs for manpower and raw materials. Soviet costs in these areas are significantly lower than are ours. Pro-rating Soviet labor and raw materials costs at typical U.S. rates would skew the total figure to well above [deleted] annually.

Senator QUAYLE. I believe you have indicated that we have about $5 billion committed to the armor/anti-armor effort. In terms of fielding new technologies and rates of modernization, the Soviets must be spending enormous amounts. How much would we have to spend to surpass the Soviets in fielding new technologies and modernization rates in the armor/anti-armor arena?

General PIHL. On the average, about every [deleted] the Soviets modernize by fielding a new model of tank or by making major product improvements to their tank fleet. They apply this strategy to their other armor/anti-armor systems, as well. To outpace Soviet modernization efforts we must sustain, on a long term, spending at the levels I stated earlier—$5.15 billion annually, adjusted to keep pace with inflation. We need to turn inside the Soviet development cycle by modernizing the mobilization plus 10 days force every [deleted] years.

NEW ANTI-ARMOR EFFORTS

Senator QUAYLE. It seems to me that we have to break the mold of thought that drives us toward continually trying to kill tanks by punching holes in increasingly difficult-to-penetrate frontal armor.

Is there any creative, innovative thought being given to disabling tanks or rendering them inoperative through some other means? Can you describe any of these efforts?

General SHOFFNER. You asked about anti-armor weapons that utilized innovative approaches, other than attempting to penetrate the frontal armor of Soviet armor. There are, in fact, several programs the Army is examining. I say examining because we are exploring the countermeasures to these programs as we go. [Deleted.] Other efforts focus on the use of smart mines, such as Wide Area Mines (WAM). These mines are programmed to attack the more vulnerable portions of an armored vehicle. Using multiple delivery means, WAM will be employed throughout the battlefield. Hand emplaced, VOLCANO, and MLRS will deliver WAM in the close battle. The Army Tactical Missile (ATACM) will be used for WAM deep attack. Another anti-armor system could be the ATACM with smart top-attack sub-munitions. We are striving to field a number of affordable systems with a variety of kill mechanisms. Our overall approach is to present the Soviet commander with multiple ways for his forces to die, while ensuring that the Soviet cost to countermeasure all of the systems is prohibitive.

ANTI-ARMOR WEAPONS SYSTEMS—MEDIUM (AAWS-M)

Senator QUAYLE. With the increasingly harder, more difficult-to-penetrate armor, is a single man portable system technologically feasible?

General SHOFFNER. Yes. The Army believes that it is technologically feasible to build a single man portable system that can defeat a tank. We believe that this can be done by using techniques that attack the tank other than through the highly protective frontal armor. The current Advanced Anti-armor Weapons Systems-Medium (AAWS-M) program is developing and competing three technological approaches that defeat the tank's armor system by penetrating the weaker top armor.

Senator QUAYLE. Are you confortable that a system like AAWS-M will be effective by the time we get it fielded?

General SHOFFNER. Yes. When the system requirements were written it required not only defeat of the mid-90s threat as best we could describe it, but also included a requirement that the system be capable of product improvements to meet the evolving threat. The approach of continuous review and iterative system improvements is necessary because the threat will continue to improve, and we cannot foresee all possible threat developments in the typical 20–30 year life cycle of a weapons

system. Through incremental product improvements, we can maintain system effectiveness.

Senator QUAYLE. What programs do we have in R&D to develop a light, handheld, anti-armor weapon for close-in use by light infantry?

General PIHL. We have two programs in this area. The first is called the Man Portable Individual Munition (MIPM) which is intended for use against light armored targets such the Soviet infantry fighting vehicle (BMP) and fortified bunkers. The second is a man portable laser device for use by infantry to provide a soft kill against armored targets by attacking sensors, including TVs, night vision devices, and personnel.

Senator QUAYLE. How much money are we spending on these programs?

General PIHL. The funding profiles for these two programs are shown below:

	Fiscal year—		
	1987	1988	1989
MIPM	$11.7M	$11.0M	0
Laser	0.195M	0.411M	$2.5M

Senator QUAYLE. Given our emphasis on light forces, do these programs have high enough priority?

General SHOFFNER. Yes. They have an appropriately high priority considering their impact on the overall Army combined arms team warfighting capability. The single man protable tank defeating weapon, the AAWS–M, is fully funded in the current Army budget and in all Army future budget projections. This is one of the few systems that has not lost a portion of its funding in recent budget contractions.

EVOLUTIONARY VERSUS REVOLUTIONARY DEVELOPMENT

Senator QUAYLE. One of the things the Soviets seem to do well is to continually make product improvements on their fielded systems in an evolutionary way, while we seem to be more inclined to develop a whole new system—more of a revolutionary development. Would you comment on this?

General PIHL. I agree that the Soviets have been particularly effective in introducing evolutionary changes to their fielded systems. In the past 22 years alone they have applied nine major product improvements across the 60,000 tanks in their fleet and have constructed the retrofit facilities required to sustain such product improvement programs in the future. Such an approach clearly makes sense for a country which already enjoys a substantial quantitative advantage over its adversaries and frequently does not have the clear technological advantage with which to pursue revolutionary designs. On the other hand, the Soviets have certainly not abandoned the practice of developing and fielding radically new systems, when such an approach has been to their advantage. For example, during the same 22 year period that the Soviets fielded their nine product improvements, they also developed and fielded four major new tank designs: the T64, T72, T80 and FST I. This provided them with the opportunity to frequently gain a temporary qualitative as well as quantitative advantage over western tank forces as a whole. We believe that the Soviets are continuing to develop revolutionary concepts such as turretless tanks today. The United States, like the Soviets, also emphasizes evolutionary product improvements as the preferred approach to addressing new operational requirements. Thus, we were able to stretch the useful life of the M60 tank as a top line combat system for nearly 20 years by product improving it first to the M60A1, then M60A1 with add on stabilization, the M60A2, and finally M60A3. We are product improving the M1 series tank even faster, having progressed from the basic M1 to the improved M1, and finally to the M1A1 with its 120mm gun, in less than six years. The Armored Family of Vehicles, which is based upon modular design and common components, will enhance our capability to continue evolutionary product improvements in the 21st century.

In addition to product improvements, however, the United States must continue to pursue revolutionary approaches that take advantage of those areas where we enjoy a technological lead and allow us to achieve a qualitative advantage on the battlefield. It is only by fielding these advanced technologies and concepts that we can ever hope to offset the tremendous numerical advantages of the Soviets. Thus today, we are pursuing development of technologies such as directed energy weapons and high density ceramic armor, and concepts such as the Armored Family of

Vehicles to provide the basis for the production and fielding of revolutionary armor and anti-armor systems in the future.

MILAN 2—BOFORS BILL

Senator QUAYLE. Over the past few years, based on initiatives from the Authorizing Committee in the House, the Army was directed to test at least two foreign systems, the MILAN 2 and the BOFORS BILL, for possible use as an interim medium anti-tank weapon.

Would you discuss what you may have learned so far in these tests and the usefulness of this effort?

General PIHL. While the final evaluations have not been completed on the MILAN II or BILL systems, we do have some emerging results. MILAN II has undergone thorough technical and operational evaluations under the toughest operational and most demanding technical conditions. [Deleted.] The DRAGON III system is still in development. Only limited testing has been conducted by the Marine Corps on a prototype missile and breadboard tracker. No Army testing has been done on DRAGON III.

QUESTIONS SUBMITTED BY SENATOR JOHN MCCAIN

DETAILED CHRONOLOGY ON THE ARMOR/ANTI-ARMOR DEBATE W/DSB

Senator MCCAIN. General Shoffner, I gather that the Army has only slowly come to accept the views of experts like Phillip Karber and the members of the Defense Science Board regarding the advances in Soviet armor/anti-armor technology. I am worried both about the implications of this forewarning and the uncertainty involved. Could you provide us with a detailed chronology of the debate on this issue between the experts in the DSB, experts like Karber, and the Army and indicate the lessons you draw in terms of warning and our ability to carry out net assessments of the NATO and Warsaw Pact balance?

General SHOFFNER. No formal debate between the Army and the subject matter experts or members of the Defense Science Board occurred on the subject of armor/anti-armor. Therefore, no chronology can be provided. Within the Office of the Secretary of Defense, the Office of Net Assessment is tasked to conduct net assessments including the NATO Warsaw Pact balance. Additionally, as you know, the Chairman, Joint Chiefs of Staff is required to provide the Congress a military net assessment with the President's budget submission. The Army can and does conduct assessments as it did in the area of armor/anti-armor technology during the 1987 timeframe. The Army's armor/anti-armor net assessment clarified the growing imbalance between the Soviet Union and the United States.

TANK AND ANTI-ARMOR MODERNIZATION

Senator MCCAIN. Could you provide us with a detailed assessment of the rate of tank and anti-armor modernization in each NATO and Warsaw Pact country in the Central Region showing the current balance both by weapon system and by generation of modification?

General PIHL. We are currently compiling this information. As an interim response the following summary is provided.

Generally, the Non-Soviet Warsaw Pact (NSWP) countries substantially lag the Soviets in armor/anti-armor modernization. Those forces intended for employment in the Western Theater (Poland, Czechoslovakia, and East Germany), combined, have about [deleted] main battle tanks. However, only about [deleted] of these are in the T-72 class. Only Soviet forces are given the latest, best protected, and most lethal tank systems (T-64B, T80, and FST I). Among these same three countries, there is a combined total of [deleted] attack helicopters; comprised mostly of the older HIND-D and -E variants. NSWP anti-tank missile launchers consist mostly of AT-3 (SAGGER) variants. A few AT-4 and AT-5 launchers are also fielded among these forces.

Soviet forces in the Western Theater are very well equipped. Their tank holdings consist primarily of the T-80, T-64B, and T-72 (M1981/3) modernized tanks. Some [deleted] of these variants are believed to be equipped with reactive armor mounting apparatus'. The T-80 and T-64B are capable of firing the AT-8 (SONGSTER) missile. Forward deployed Soviet ground forces are equipped with the most recently developed ATGM launchers. These include improved AT-4 (SPIGOT), AT-5 (SPAN-

DREL), and the man-portable AT-7 (SAXHORN). Soviet HIND-D, -E, and -F attack helicopters are armed with the AT-6 (SPIRAL) missile [deleted].

From an allied perspective, U.S. forces in Central Europe are the best equipped, followed closely by the West German forces. There are approximately [deleted] main battle tanks in the total tank inventories of the FRG, France, UK, Netherlands, Belgium, and forward deployed stocks (including POMCUS and War Reserve) [deleted] are armed with 120mm main tank guns. The most distinct tank lethality "mismatch" among Central European opposing forces is in NORTHAG—in particular, the Belgian and Dutch Corps sectors.

The most widely proliferated ATGM systems in Central Europe are the MILAN, HOT, and TOW. There are about [deleted] of these systems currently deployed (including helicopters). Forward deployed U.S. launchers [deleted] comprise about [deleted] of the total commitment. Only U.S. forces are equipped with TOW 2A missiles, which are fired from our M901 Improved TOW Vehicle. There are approximately [deleted] attack helicopters among the forward deployed NATO Central European forces (including all French assets). Only the 21 forward deployed AH-64 attack helicopters are equipped to fire the Hellfire missile. The West German PAH-1, British Lynx, French Gazelle and Alouette, and U.S. AH-1 (Cobra) are equipped mostly with HOT I/II and ITOW/TOW II launchers.

ARMY ESTIMATE OF TRENDS DURING 78-87 AND 88-94

Senator McCAIN. Could you show us how the Army's reappraisal of the Soviet threat affects the overall balance in the Central Region as measured in terms of the total score by NATO and Warsaw Pact countries for all tank and anti-tank weapons, using some measure like the Weapons Effectiveness Index, and how it affects the Army's estimates of the trends in the balance during 1978-1987, and 1988-1994?

General SHOFFNER. The Army no longer uses Weapon Effectiveness Indices (WEIs). However, by any measure of merit the Soviets are significantly moving ahead of us in modernizing their conventional forces. Perhaps the most illuminating measure is the number of new systems the Soviets have fielded with respect to the U.S. in the past three decades. For example, for 1960 to 1987 the Soviets [deleted].

WESTERN ANTI-TANK WEAPON HOLDINGS

Senator McCAIN. Could you provide us with an analysis of the current anti-tank weapons holdings in each NATO country that are capable of defeating modern Soviet tank armor by weapons type, and give us your projection of the trends through the early 1990s?

General SHOFFNER. Currently, only the [deleted] head precision guided munition appear to be capable of frontally [deleted] modern, reactive armor equipped Soviet tanks at combat ranges out to 2km. With near-term modification, we will also restore Hellfire lethality. The entire NATO ground forces array of tank-fired munition and unitary shaped-charge ATGM is currently inadequate. Our West German and French allies are believed to be working on [deleted] improvements for their MILAN 2 and HOT 3 missiles. If successful in these efforts, they may [deleted].

Although all of our NATO allies are developing improved kinetic energy munitions for their tanks, only the United States will likely be capable of fielding [deleted]. The developmental DM 33 (German 120mm) round is about to be fielded; however, it is [deleted]. The British are still developing improved kinetic energy ammunition for their L23 and CHARM (120 mm) rifled tank guns; but [deleted]. Not much is known about French kinetic energy development. Their entire tank fleet, though, will remain equipped with 105mm guns until the "LeClerc" tank begins fielding [deleted].

A consortium of UK/FR/FRG developers are developing the TRIGAT (tandem shaped-charge) ATGM, in both medium- and long-range versions. Both missiles will likely to capable of defeating Soviet tank armors of the mid-1990s. Fielding dates for these weapons are projected as [deleted] respectively.

FORWARD DEPLOYED TANK HOLDINGS

Senator McCAIN. What are the current numbers of improved Soviet battle tanks now deployed forward and what is the projected trend through the early 1990s?

General SHOFFNER. We estimate that there are [deleted] modern Soviet and Warsaw Pack main battle tanks now forward deployed in the Western Theater of Operations. Included in this figure are T-80, T-64B, T-64A, and T-72M1 tanks with laminated steel and ceramic or composite frontal armors. Some [deleted] of these

tanks are equipped with reactive applique armor, which makes them extremely well protected against Western (unitary) shaped-charge munitions—[deleted].

By 1994, the Soviets will significantly upgrade their forward deployed tank holdings. At their current modernization rate, there will be over [deleted] modern tanks; including the FST I, T-80, T-64B, T-64A, and T-72M1. We project that [deleted] of these tanks will be equipped with the current (or improved) reactive applique armor.

[Whereupon, at 4:24 p.m., the subcommittee was adjourned.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1989

THURSDAY, APRIL 14, 1988

U.S. SENATE,
SUBCOMMITTEE ON CONVENTIONAL
FORCES AND ALLIANCE DEFENSE,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

BUDGETED AND UNBUDGETED ALTERNATIVES FOR IMPROVING CONVENTIONAL DEFENSES IN NATO, INCLUDING AIR DEFENSES

The subcommittee met in open session, pursuant to notice, at 1:08 p.m., in room 232A, Russell Senate Office Building, Senator Carl Levin (chairman) presiding.

Present: Senators Levin, Dixon, and Quayle.

Staff present: Romie L. Brownlee, deputy staff director for the minority; Sherri Wasserman Goodman, John J. Hamre, George K. Johnson, Jr., and Daniel J. Wildfong, professional staff members; and Cindy Pearson, staff assistant.

Also present: Milton D. Beach, assistant to Senator Glenn; Robert K. Griffith, assistant to Senator Wirth; Terrence M. Lynch, assistant to Senator Shelby; Henry D. Sokolski, assistant to Senator Quayle; and Mark J. Albrecht, assistant to Senator Wilson.

OPENING STATEMENT OF SENATOR CARL LEVIN, CHAIRMAN

Senator LEVIN. Good afternoon everybody. The Subcommittee on Conventional Forces and Alliance Defense meets this afternoon to receive testimony on budgeted and unbudgeted alternatives for improving conventional defenses in NATO, including air defenses.

This is an unusual title for a hearing, but it is designed to review and consider a variety of suggestions to improve our conventional defenses in NATO. One of the consistent themes to emerge from the INF hearings and other hearings is that NATO must find ways to strengthen its conventional defenses. But most observers acknowledge we have to do that with constrained defense budgets.

Ambassador David Abshire said during these hearings that NATO has got to think smarter, not richer. The hearing this afternoon is intended to help us think smarter by reviewing a number of interesting ideas.

Our witnesses this afternoon are John A. Woodworth, Deputy Assistant Secretary of Defense for European and NATO Policy, and Maj. Gen. Charles J. Fiala, Chief of Staff of the U.S. Army Forces

in Europe. Mr. Woodworth and General Fiala are accompanied this afternoon by Lt. Gen. John F. Wall, Commanding General of the U.S. Army Strategic Defense Command, and Brig. Gen. Larry R. Capps, Program Executive Officer for High to Medium Air Defense Systems for the Army.

Generals Wall and Capps are here as backup witnesses to answer any questions that might come up regarding air defenses, and especially the issue of extended air defenses. This topic is one of the 10 issues listed in a letter to Dr. Lehman who is represented today by Mr. Woodworth.

Before we begin, I would like to insert for the record the prepared statement of Senator Alan Dixon.

[The prepared statement of Senator Dixon follows:]

PREPARED STATEMENT BY SENATOR ALAN J. DIXON

Mr. Chairman, I am pleased to welcome Ambassador John Woodworth, Deputy Assistant Secretary of Defense for European and NATO Policy, and Maj. Gen. Charles Fiala, Chief of Staff, U.S. Army Europe and the 7th Army Command.

While this committee has been concerned with the conventional defense capabilities of the United States and its NATO allies for many years, the topic has taken on a new sense of urgency with the progress in limiting nuclear weapons in Europe. Many witnesses have testified during our hearings on the INF Treaty, and almost all have stressed the need to continue to modernize and upgrade our conventional defense forces in Europe. The serious imbalance in conventional capabilities with Soviet and Warsaw Pact forces has been highlighted repeatedly in testimony before this committee. The chairman's excellent study of conventional forces, "Beyond the Bean Count," has made a significant contribution to the debate. But by all counts the Soviet's numerical superiority and the increasing quality of their weapon systems poses a grave threat to the security of the NATO alliance.

We must conduct a careful review of the budget proposed by the Secretary of Defense to ensure that conventional forces are funded to a level that will meet the increasing Soviet threat. The overriding reliance by our allies on strategic and tactical nuclear weapons as the main line of European defense is under question. The Soviets must never have a sufficient degree of assurity that they can quickly win a conventional war. We must maintain sufficient defensive and offensive forces to make such an outcome high unlikely.

The United States has willingly carried the burden of the defense of Europe since World War II. The participation of our allies in their own defense must increase in the coming years. I hope that our witnesses today can shed some light on the state of European opinion on increasing their share of the NATO defense budget.

Thank you Mr. Chairman.

Senator LEVIN. I guess we are ready for you. Would you like to begin with your testimony, or summary of your testimony?

STATEMENT OF AMBASSADOR JOHN A. WOODWORTH, DEPUTY ASSISTANT SECRETARY OF DEFENSE FOR EUROPEAN AND NATO POLICY, OFFICE OF THE SECRETARY OF DEFENSE

Ambassador WOODWORTH. Yes, sir, I can do that. I have a prepared statement which, if you agree, I can submit for the record and make some brief summary remarks.

Senator LEVIN. Thank you very much. We will do that Mr. Woodworth.

Ambassador WOODWORTH. I welcome this opportunity to testify on improving NATO conventional defense. I would like to underline at the outset that the key need in the post-INF environment is to continue with ongoing NATO programs for force improvement in both nuclear and conventional areas. These programs are an implementation of the 1983 Montebello decision on nuclear force mod-

ernization, and the 1984 Initiative for Conventional Defense Improvements (CDI) in NATO.

Since our focus today is conventional defense, let me turn in more detail to the CDI.

The CDI action plan calls for nations to make a special effort to implement highlighted force goals that are directly aimed at critical deficiencies in NATO's conventional defense. The United States has endeavored to set an example in this regard, and the highlighted force goals for the United States have received a high priority in our amended budget for fiscal year 1989.

I know that some members of the subcommittee have a particular interest in certain aspects of the CDI effort. For example, Senator Quayle's NATO Defense Initiative includes programs that are especially relevant to CDI deficiencies in air defense and Follow-on Forces Attack (FOFA). These programs are funded in our fiscal year 1989 amended budget.

We must also take care to ensure an appropriate balance among our contributions to NATO's conventional defense. Air defense and FOFA, for example, are only two of nine agreed deficiency areas. The other deficiencies involve various shortfalls in ground forces, mobilizable reserves, sustainability, reinforcement, command and control, maritime forces, and Southern Region forces.

I also know that members of this subcommittee are actively seeking innovative ways to strengthen NATO's conventional defense. We applaud such efforts and are similarly engaged in exploring new ways to improve our conventional force posture.

NATO is making important progress, for example, in the area of armaments cooperation. The 1985 Nunn amendment has served as a strong impetus to cooperative programs, and the new NATO conventional armaments planning system should result in a much improved framework for harmonizing national armaments plans with the long-term requirements of major NATO commanders.

Another approach which may hold promise for the future is our competitive strategies initiative. We are moving forward with validation studies and further refinement of the competitive strategies approach, and will keep Congress informed of our progress.

As we move forward in these and other areas we must concentrate on the achievable. In each case there is a need to consult with appropriate political and military authorities both here and within NATO. While we must not be timid in proposing creative alternatives, we must have realistic expectations and also the patience to follow through to ensure the success of our initiatives.

We must also seek, of course, to ensure an adequate level of resources for defense. In the face of the continuing Soviet military build up, we cannot expect to maintain an effective conventional defense while continuing to cut back on our defense expenditures.

At the same time, we should not base our future defense planning on assumptions of a favorable outcome from the conventional stability talks. As the INF negotiations made clear, we cannot expect an equitable agreement unless we demonstrate our determination to proceed with essential force improvements.

I would like to turn in conclusion to the issue of allied burdensharing. Our latest burdensharing report, submitted to Congress on March 22, has reached conclusions which we believe to be bal-

anced, identifying where there are areas deficient in burdensharing, and also identifying where the burden is widely shared.

We do not believe that responding with punitive measures which have been suggested from time to time, such as U.S. troop withdrawals from Europe, would save money. Such measures could well be counterproductive in dealing with this very important issue.

On the other hand, we are far from satisfied with allied burdensharing, and share the concerns of the Congress to encourage greater efforts. Secretary Carlucci is personally engaged in seeking to ensure that the roles, risks and responsibilities of the alliance are equitably shared.

He has appointed a special task force under Deputy Secretary of Defense William Taft, to oversee this effort and to develop specific proposals for discussion with our NATO allies. A joint State-Defense team will pursue this initiative in selected allied capitols later this spring.

In short, we attach high priority to NATO conventional defense, and are actively pursuing both ongoing programs and new initiatives for improvement. If we continue to work together in close cooperation with one another, and with our NATO allies, I am confident that we can meet the challenges that lie ahead. Thank you very much.

[The prepared statement of Ambassador Woodworth follows:]

TESTIMONY OF
JOHN A. WOODWORTH

Mr. Chairman, members of the Subcommittee:

I welcome the opportunity to testify on improving NATO conventional defense, especially in view of the heightened interest in this topic in the wake of the INF Treaty.

I would like to underline at the outset that the INF Treaty is fully consistent with the agreed NATO strategy of Flexible Response. As Secretary Carlucci stated in his testimony of 25 January before the Armed Services Committee, the INF Treaty preserves intact NATO's strategy as a credible framework for deterring aggression and intimidation, permitting NATO to maintain a mix of nuclear and conventional forces adequate to the threat.

In my view, the INF Treaty has strengthened our security, and NATO's military posture is sufficiently robust to confront a potential aggressor with major uncertainties about the consequences of launching a nuclear or conventional attack against NATO. But this favorable judgment is conditional. It depends upon NATO's determination to sustain both nuclear and conventional modernization. In each case, the need for such improvements was well established long before the INF Treaty. For example, NATO reached the Montebello decision on nuclear force modernization in 1983, and the current program for Conventional Defense Improvements (CDI) was launched in 1984.

Since our focus today is conventional forces, let me turn in more detail to our efforts in this area, in particular CDI. The detailed plan of action for CDI, approved by NATO Defense Ministers in May 1985, identified several critical deficiencies in NATO's conventional defense. The CDI action plan also

called upon the NATO Military Authorities to develop specific measures, in the form of highlighted force goals for each member nation, to help correct those deficiencies. Nations in turn agreed to make a special effort to implement the highlighted force goals in full.

The United States has endeavored to set an example for other nations by making every effort to achieve full implementation of its highlighted force goals. As Secretary Carlucci has indicated in prior budget testimony, these NATO force goals received a high priority in our amended budget for FY 1989 and will continue to receive a high priority in the development of our budget request for FYs 1990 and 1991.

I know that some members of this subcommittee have a particular interest in certain aspects of the CDI effort. For example, Senator Quayle's NATO Defense Initiative includes programs that are especially relevant to CDI deficiencies in air defense and Follow-on Forces Attack. Secretary Carlucci has already made clear that the key programs involved are funded in our FY 1989 amended budget.

At the same time, we must take care to ensure a necessary balance among the U.S. contributions to NATO's conventional defense. While air defense and FOFA are important, they are only two of nine agreed deficiency areas. The other deficiencies involve various shortfalls in ground forces, mobilizable reserves, sustainability, reinforcement, command and control, maritime forces, and Southern Region forces. We must direct our efforts toward ensuring that all the critical deficiencies receive adequate attention and corrective treatment.

Coupled with our CDI effort which is directly aimed at key deficiencies is the need to ensure an appropriate balance with

other conventional programs that contribute to NATO's defense. Inadequate attention to the latter could well create future key deficiencies and thereby aggravate the problem that CDI is designed to correct.

I also know that members of this subcommittee are actively seeking innovative ways to strengthen NATO's conventional defense, and I would be happy to discuss your specific ideas for improvement. I applaud such efforts and can assure you that the Department of Defense is similarly engaged in exploring new and creative ways to improve our conventional force posture. Especially in an era of constrained budgets -- as President Reagan reminded his colleagues at the recent NATO Summit -- we must continue to strive to make more innovative and effective use of our scarce resources.

An example in this regard is armaments cooperation, which is a key element of the overall CDI effort. As the Congress has noted, armaments cooperation reduces wasteful duplication of research and development and increases the efficiency of defense production through economies of scale. The 1985 Nunn Amendment has served as a strong impetus to cooperative programs in NATO, and work is now underway on 12 Nunn Amendment research and development projects that hold promise of yielding important benefits for NATO's conventional defense. A recent NATO initiative for improved armaments cooperation is the agreement to develop and test a Conventional Armaments Planning System (CAPS). A two-year trial of CAPS has been launched, and we expect it to result in a much improved framework for fostering armaments cooperation and for harmonizing armaments plans with the long-term requirements of the Major NATO Commanders.

Another approach which may hold promise for improving

NATO's conventional defense is our competitive strategies initiative. I believe that the competitive strategies task force on Europe has developed important concepts around which we can structure valuable improvement in NATO's defense posture. We are moving forward with validation studies and further refinement of the competitive strategies approach as we seek to determine the best way to implement the task force's recommendations. We intend to proceed at a deliberate pace to ensure the soundnesss of proposals that are developed from this initiative. We will keep Congress informed of our progress.

As we move forward in all of these areas, we must concentrate on the achievable. An idea that is politically attractive may pose serious military problems. Alternatively, an idea that makes eminent sense militarily may pose serious political problems. In each case, there is a need to consult with appropriate political and military authorities both here and within NATO. Especially in the NATO context, where new departures require the unanimous approval of all the nations involved, too many new ideas can quickly overload the circuits. We must not be timid, of course, in exercising our leadership and proposing creative alternatives. But we must also have realistic expectations and the patience to follow through to ensure the success of our initiatives.

In addition to the need for balance and for innovative ideas (tempered by realistic expectations), we must also seek to ensure an adequate level of resources for defense. The fact is that in the face of the continuing Soviet military buildup, the U.S. cannot expect to maintain an effective conventional defense capability while continuing to cut back its defense expenditures. We have tried, within the limits

of current budgeting constraints, to formulate a FY 1989 budget that maximizes the effectiveness of our resource use and gives a high priority to key NATO programs. But the recent net reductions in our defense spending, if maintained for several years as occurred in the 1970's, could seriously harm U.S. national security.

I would like to remind the members of this subcommittee of the agreed NATO goal of a 3% real increase in annual defense expenditures. We pushed NATO to reaffirm this goal, to which we as well as the allies are committed, as recently as last year. In DOD's view, the 3% objective continues to reflect a valid assessment of the resource levels required to ensure an effective deterrent and defense capability in the 1990's.

The situation could change, of course, if we are able to obtain a successful outcome from the conventional stability talks. But we cannot base our defense planning on assumptions of favorable outcomes in arms control negotiations. As the INF negotiations made clear, we cannot expect an equitable agreement for arms reductions unless we demonstrate our determination to proceed with essential force improvements. Hence, the argument for continuing to provide an adequate level of resources for defense is two-fold. Not only is this critical to ensuring an effective defense in the face of the continuing Soviet buildup, but it is also critical to achieving equitable arms reductions and halting that Soviet buildup.

I would like to turn in conclusion to the issue of allied burdensharing. We have just completed our annual Report to the Congress on Allied Contributions to the Common Defense. This report finds -- and I believe that it is an objective report, despite some recent criticisms -- that our

allies are doing much better than is commonly recognized. Part of the problem is that burdensharing critics tend to focus on selected indicators that best support their case. As the report makes clear, there is no universally accepted formula for calculating each country's "fair share." In addition, there are many intangibles involved. It seems ironic, in fact, that we have so many expressions of renewed concern about inadequate allied contributions at a time when we have recently achieved additional burdensharing successes, such as the INF Treaty, a milestone event for which allied cohesion and solidarity were absolutely essential; and the Persian Gulf, where several allied nations have sent warships to help patrol this vital area.

All too often, the criticisms of allied burdensharing are accompanied by calls for punitive action, such as U.S. troop withdrawals from Europe. It must be re-emphasized that we maintain troops in Europe not as a favor to the Europeans, but to protect our own vital interests. Major troop withdrawals from Europe would seriously exacerbate NATO's conventional inferiority vis-a-vis Warsaw Pact forces and gravely imperil U.S. national security. Substantial unilateral troop withdrawals would also devastate our negotiating leverage in the conventional stability talks, and thoroughly demoralize our allies, who would likely reduce their own efforts as a consequence. Moreover, there would be no savings in the U.S. defense budget for many years unless the withdrawn troops were demobilized and removed from the active forces.

This is not to say that we are satisfied with allied burdensharing. Quite the contrary. All allied nations, including the U.S., should do more for defense. In addition,

while some nations appear to be doing at least their fair share, a few are making financial contributions substantially below their fair share. For many others, the indicators yield a mixed picture. One area of particular concern, in view of our focus today, is allied performance in implementing the CDI-highlighted force goals. The non-US allies, as a group, plan to accomplish a large number and wide range of required improvements. There are, nevertheless, substantial differences among countries. As a general rule, those countries with high CDI implementation rates last year (mainly the larger allies) achieved at least as good or slightly better percentages this year, whereas countries with poor implementation rates last year scored at least as poorly or noticeably worse this year.

Secretary Carlucci is personally engaged in seeking to ensure that the roles, risks, and responsibilities of the Alliance are equitably shared. In fact, a major effort to make more innovative and effective use of NATO resources on an equitably shared basis is already underway. To oversee this effort, Secretary Carlucci has appointed a Special Task Force to be chaired by his deputy, Will Taft. This Special Task Force will develop specific proposals for discussion with our allies on a bilateral basis or in appropriate NATO fora. We are forming a joint State-Defense team to pursue this initiative in selected NATO capitals later this Spring. At the same time, we are seeking the advice of outside experts on a broad range of burdensharing issues. This will be an important part of our effort to highlight burdensharing as an issue on which we must work together with our allies, with long-term as well as short-term solutions in mind.

In short, we attach high priority to NATO conventional defense and are actively pursuing both ongoing programs and

new initiatives for improvement. I have sought today to place these efforts in perspective. For example, we must maintain an appropriate balance among our programs and take a realistic approach to innovation. We should also bear in mind that an adequate level of resources for defense is absolutely essential. In addition, while we need to press our allies for greater and more efficient contributions, we should not discount their current efforts or react with punitive measures that could jeopardize our national security.

I am confident that we can meet the challenges that lie ahead if we continue to work together in close cooperation with one another and with our NATO allies. The Atlantic Alliance has preserved the peace in Europe for forty years and remains our best hope for the defense of Western values. As suggested in earlier testimony, we do not need a revolutionary new approach to NATO security. The essential challenge is to reinforce and build on our current plans and initiatives.

Senator LEVIN. Thank you Ambassador. General Fiala.

STATEMENT OF MAJ. GEN. CHARLES J. FIALA, USA, CHIEF OF STAFF, U.S. ARMY EUROPE/7TH ARMY ACCOMPANIED BY LT. GEN. JOHN F. WALL, USA, COMMANDING GENERAL, UNITED STATES ARMY STRATEGIC DEFENSE COMMAND/PEO AND BRIG. GEN. LARRY R. CAPPS, USA, PROGRAM EXECUTIVE OFFICER, HIGH TO MEDIUM AIR DEFENSE [HIMAD]

General FIALA. Mr. Chairman, I, too, have a prepared statement for the record which you have said I may submit.

Senator LEVIN. It will be made part of the record. Thank you.

General FIALA. On behalf of General Galvin, Commander-in-Chief of the U.S. European Command, I welcome this opportunity to contribute to our examination of improving conventional defenses in Europe. Prior to addressing these specific issues, it may be helpful to outline our mission in its key contributing elements.

As Commander-in-Chief of the U.S. European Command, General Galvin is responsible for U.S. military activities in Europe and most of Africa, an area encompassing over 13 million square miles and including 77 countries, about 43 percent of the world's nations.

Our mission, succinctly stated, is to deter war and to maintain the peace with freedom that the West has enjoyed for nearly four decades. The objective of all our efforts is peace.

As outlined in President Reagan's U.S. National Security Strategy, the defense of Western Europe is second in priority only to the defense of North America. Were Western Europe, location of 46 percent of America's overseas investment, forced into the Soviet orbit, the global balance of military and economic power would shift overwhelmingly to the Soviets. Twice in this century the United States has entered into a world war to prevent a government antithetical to U.S. interests from dominating Europe.

Our NATO alliance has made such action unnecessary for over four decades; the most successful peace movement of modern times. Therefore, the United States is committed, not in an act of charity, but in the defense of our own vital interests, for a peaceful and free Western Europe. The most visible symbol of this U.S. commitment remains 326,000 American soldiers, sailors, airmen, and marines manning credible conventional and nuclear systems, standing shoulder-to-shoulder with their alliance partners to deter all threats to peace and security.

You will note that I have emphasized that our continued ability to deter rests on three fundamentals: ideas, weapons, and people. And, should deterrence fall, these same three ingredients will be, as they always have been, the keys to success on the battlefield.

Several of the initiatives which we may discuss today concern ideas, ideas as to how the battlefield ought to be structured and the forces organized. While these are important ideas which we will be most interested in pursuing with you, we should not forget the ideas for which we fight may well be as important as the ideas with which we fight.

The strength of our collective commitment to peace with freedom remains as solid today as it was when NATO was founded. Our cohesion as an alliance is centered on the belief that this core idea which keeps us together is stronger than any attempt to drive us apart.

Nevertheless, we must always be careful to ensure that progress in the pursuit of adequate alliance defense is not purchased at the price of tearing the fabric of alliance cohesion.

Some of the initiatives indicated as alternatives for the improvement of conventional defenses involved weapons and materiel. Improvements in the tools of war are critical, both for continued deterrence and for successful prosecution of battle, should that need arise. But I need not convince the distinguished members of this committee of that simple truth.

Rather, I would highlight the needs of the forward deployed force in Europe, that the modernized equipment and ammunition be available in time, in quantity, and in a sustainable condition that will allow the battle to be waged successfully against a force greatly superior in numbers to our own.

Modernization for us is not complete. In many ground combat areas with which I am most familiar—such as Apache attack helicopters—it is just beginning, while in others—such as the M2 Bradley Patriot and the MLRS—we are about halfway through our scheduled fielding plan. And once fielded, we need to train exten-

sively on this equipment so that if it must be used in anger, its crew may reap the benefits of its improved technology.

The other services in Europe are in similar situations. Since none of us will fight alone, we all seek your support to keep needed modernization, training, and sustainment on track. People are the one key element who I believe did not receive sufficient attention in the possible initiatives to be examined by this committee. Ideas on weaponry are of little use unless we are able to attract, train, motivate, and retain the people who make them work.

I know you are committed to taking proper care of our soldiers, sailors, airmen, and marines, and their families, by providing them adequate compensation, medical care, housing, and family care. We must also ensure reasonable working, living, and recreational facilities. Of great importance as well, we must afford them the satisfaction that comes from rigorous training, from being a part of an ably led team, and from knowing that their country and its civilian leadership truly care for them.

Recent budget cuts have already forced us to take a number of difficult steps: to extend tours overseas; to delay promotions; to divert some troops from training to base operation activities; to reduce family support programs, child care facilities, libraries, and recreation centers; to cut funding of morale, welfare, and recreation facilities and activities; and to delay or cancel needed Department of Defense Schools' construction. To offset the budget cuts in funding of morale, welfare, and recreation activities, we have had to close facilities, reduce staffing, and increase recreation center rates by 25 percent.

Troops in Europe have also had to contend with the falling dollar, which over the last 2 years has cut in half their discretionary income. One small, but important, example illustrates the effect of the dollar slide. Two years ago a 20-minute phone call to distant families in the United States from Germany cost $35. Today, with no increase in German telephone rates, that same phone call costs over $80.

For many of our junior enlisted personnel, a tour to Europe has become even more of a sacrifice than it was in the past, making our retention rates and efforts more difficult than they have been since the late 1970s. I strongly urge your full consideration of, and support for, initiatives which will help us retain our strongest combat multiplier, our people.

In conclusion, as we face the challenge of working together toward prudent levels of deterrence, we must not accept solutions that unreasonably increase the risk to Western security or reduce our commitments to our allies and friends. American forces are deployed in Europe because it is in the U.S. national interest to do so. Those forces must be maintained in a manner that allows them to face with confidence the Warsaw Pact forces deployed on the borders of NATO.

There are no easy solutions to the challenges we and our European allies face in deterring Soviet aggression and intimidation in Europe. I am confident, however, that our strategic approach, so successful in the past, remains correct. Our collective challenge is to ensure that the alliance has sufficient military capabilities to fulfill the dictates of our strategy and maintain the peace in

Europe for the first time in modern history, for more than a single generation. U.S. forces in Europe will be able to do that with the resources that the Secretary of Defense has requested in his fiscal year 1989 defense budget. On behalf of General Galvin, I ask for your continued support of America's commitment to the European theater as you examine improved conventional defenses in Europe.

[The prepared statement of General Fiala follows:]

STATEMENT BY MAJOR GENERAL CHARLES J. FIALA
CHIEF OF STAFF, U.S. ARMY EUROPE/7TH ARMY

Mr. Chairman and distinguished members of the Senate, on behalf of General Galvin, Commander In Chief, U.S. European Command, I welcome this opportunity to contribute to your examination of improving conventional Defenses in Europe. Prior to addressing these specific issues, it may be helpful to outline that framework which the budget and associated resource allocation process supports: mission, strategy and necessary capabilities.

Mission

As Commander In Chief of the United States European Command, General Galvin is responsible for U.S. military activities in Europe and most of Africa, an area encompassing over 13 million square miles and including 77 countries -- 43% of the world's nations. Our mission, succinctly stated, is to deter war and to maintain the peace with freedom that the West has enjoyed for nearly four decades. The objective of all our efforts is peace.

Commitment

As outlined in President Reagan's U.S. National Security Strategy, the defense of Western Europe is second in priority only to the defense of North America. Were Western Europe, location of 46% of America's overseas investment, forced into the Soviet orbit, the global balance of military and economic power would shift overwhelmingly to the Soviets. Twice in this century the United States has entered into a world war to prevent a government, antithetical to U.S. interests, from dominating Europe. Our NATO alliance has made such action unnecessary for over four decades; the most successful peace

movement of modern times. Therefore, the United States is committed, not in an act of charity but in the defense of our own vital interests, to a peaceful and free Western Europe. The most visible symbol of this U.S. commitment remains 326,000 American Soldiers, Sailors, Airmen and Marines, manning credible conventional and nuclear systems, standing shoulder to shoulder with their Alliance partners to deter all threats to peace and security.

Threat

But whom are we seeking to deter and what are we preparing to defend against? For the foreseeable future, the Soviet Union will remain the only nation able to pose a direct threat to the survival of the U.S. or the Alliance. Despite the conciliatory rhetoric of the Kremlin leadership, there has been no decrease in their conventional forces facing Western Europe, nor has there been any slow down in their rate of quantitative or qualitative modernization. In General Galvin's view, the Warsaw Pact forces facing our outnumbered forward deployed forces are stronger than ever. In the last five years the Soviet Union has out produced the United States more than 2 to 1 in tanks and infantry fighting vehicles, and 4 to 1 in artillery. During the past three years, the USSR, by itself, has outproduced the collective NATO nations in every major category of ground weapons systems. NATO is currently outnumbered roughly 3 to 1 in tanks and artillery and 2 to 1 in combat aircraft. Despite Warsaw Pact offensive force levels that far exceed any reasonable requirements for defense, there is no sign of slackening in the Pact's efforts to expand its military power.

In light of the prevailing Soviet military imbalance, particularly in their conventional forces, coupled with their continued emphasis on modernization and offensive capabilities,

we should be cautious of equating indications of greater Soviet domestic reorganization and openness with a lessening of Soviet geopolitical aggressiveness, military capabilities, or ultimate ideological goals.

Strategy

NATO, with its strategy of flexible response and forward defense, has successfully dissuaded Soviet aggression for over two decades. Flexible response has been and remains the correct strategy for NATO; taking into account the ever changing mix of Alliance political and military realities. Since its adoption in 1967, our strategy has accommodated numerous changes in our equipment and force structure--and those of our adversary. As long as it continues to be supported by a balanced triad of strategic nuclear, theater-based nuclear, and conventional forces, the strategy will remain viable. In other words, to deter war--and deterrence of war is our overriding objective--NATO must continue to possess the credible capability to respond appropriately and effectively across the full spectrum of conflict.

The Budget Process

One of the primary tasks of USCINCEUR is to identify the capabilities necessary to accomplish his assigned mission; to identify existing shortfalls, and to work with the Department of Defense to develop solutions. General Galvin has worked closely with Secretary Carlucci, Admiral Crowe, and the Service Chiefs to develop a budget that provides United States European Command sufficient resources, across the triad of forces, to maintain the necessary deterrent and combat capabilities.

General Galvin's message during the budget formation

process has been the need for balanced approach across the budget and within each pillar of defense. Flexible response depends on a credible deterrence at each level of conflict and within each leg of the triad. Additionally, balance must be achieved that not only provides a sufficient number of systems, but also the people, training and support necessary to operate, train and repair those systems. The current budget provides European Command a balanced package of deterrent capabilities which, despite reduced funding, provide the means to minimize the increased risks. Key programs needed by this theater have been preserved, as has the progress we have made recently to improve our munitions and training capabilities. We have avoided the temptation to return to the "hollow" force structure of the 70's. Additionally, we have proposed prudent investments for the future, recognizing that modernization of our forces is a continuous challenge that cannot be postponed without incurring greater risks and higher costs later. Considering both the needs of European Command and the resources available, the proposed budget achieves both the necessary balance and support for the European Command and General Galvin requests your support. Allow me to provide an overview on how some key programs support the priority requirements submitted to the Services by the European Command.

Strategic Nuclear Forces

Strategic nuclear forces are the cornerstone of both America's and NATO's flexible response deterrent strategy; the basis of our capability at the ultimate level of deterrence and combat power. Over the course of the past decade the United States and the United Kingdom have pursued vigorously programs of strategic nuclear modernization designed to maintain a secure and effective strategic deterrent. The continuation of

these programs is essential to maintaining the credibility of the strategic leg of the NATO triad. Even if we are successful in our negotiations to reduce strategic nuclear weapons, actions essential to maintaining a credible force should continue.

Theater-Based Nuclear Forces

NATO's capability to implement, if required, controlled escalation through the selective employment of theater-based nuclear weapons is central to a viable flexible response strategy. For this to be viewed as a credible option by our adversaries, theater-based nuclear weapons must provide a wide range of capabilities and be based throughout Allied Command Europe and shared by our Allies. This both demonstrates the unity of our collective effort, a "burden sharing" of risk, and complicates potential preemptive strike calculations by our adversaries. The key element is for NATO to possess sufficient capabilities to make the Soviets uncertain as to the precise timing or nature of NATO's response to aggression.

In light of the prospective eliminations of portions of the existing theater-based nuclear forces, the P-IIs and GLCMs, it is especially critical that the United States continue to implement the current programs modernizing the nuclear forces based in Europe. These programs, due course modernization plans developed long before the INF agreement and not contrary to its tenets, will be crucial to maintain deterrence in Europe at an acceptable level of risk. General Galvin attaches special importance to several of the programs that will update our theater nuclear forces. Foremost among them is the development of a tactical air-to-surface standoff nuclear missile. Also important is the enhancement of our aircraft that can deliver nuclear weapons, such as the F-15E. It is

essential that we improve the ability of these aircraft to penetrate Warsaw Pact air defenses and to survive Pact attacksagainst our home bases. We can do this through the upgrading of avionics and electronic warfare equipment and by construction of more aircraft shelters.

In order to maintain a broad spectrum of possible responses, we should also make provisions to replace the aging LANCE short-range ballistic missile and continue to make improvements to our nuclear artillery. To pursue these programs, Congress should lift the restrictions on the overall number of modernized artillery munitions and on development of the Army Tactical Missile System as a dual-capable follow-on to LANCE so it can be pursued expeditously if selected as the preferred candidate. The majority of our present 8-inch and 155-millimeter artillery rounds were deployed in the late 1950's and early 1960's. While we are not seeking an overall increase in the total number of munitions, it is important that we not delay in replacing them with more modern munitions.

Chemical Deterence

In 1969, the U.S. unilaterally halted its production of chemical weapons to both provide an example and encourage others to halt their production so that these weapons could be eliminated from all nation's arsenals. To date, this effort has been unsuccessful. Now, our usable stocks of chemical munitions are not only relatively small compared to the size of the Soviet stockpile, they are also becoming increasingly obsolete and limited in application, particularly with regard to a survivable deep-strike capability.

This situation and the lack of progress in chemical arms control prompted the United States, with NATO's support, to begin manufacturing modern binary chemical weapons. Production

commenced in December 1987 with the assembly of artillery shells, and is scheduled to extend to the BIGEYE bomb and a chemical warhead for the multiple launch rocket system. Standoff chemical weapons should be developed to complement current modernization efforts by providing the means to deliver chemical strikes throughout the depth of the battlefield. To ensure the total chemical stockpile does not exceed the minimum essential level, the modernization plans include provisions for the destruction of the unitary munitions in conjunction with the production of binary weapons.

Just as NATO's demonstration of determination in deploying P-IIs and GLCMs led to an agreement eliminating SS-20s, we hope that through development of binary chemical weapons we can stimulate progress in negotiations for a verifiable global ban on chemical weapons. The absence of such a ban insures the continued need for an adequate defensive capability to protect U.S. forces against possible chemical attacks.

Conventional Forces

NATO has never had sufficient conventional military capabilities for stand alone deterrence; instead the Alliance has tended to rely heavily on nuclear weapons, despite the Soviets having achieved nuclear parity with the West and continuing to build an ever-stronger conventional forces.

We do not need, nor intend, to match the Warsaw Pact man for man or tank for tank. What we do need is a conventional capability that is strong enough to frustrate aggression and delay, or perhaps prevent, the time before nuclear weapons may have to be used. Such a capability would preclude hasty decisions to use nuclear weapons and enhance the flexibility of NATO's strategy of flexible response. The credibility of our deterrence would also be enhanced because Soviet planners could

not be sure of gaining their objectives through a conventional attack so swiftly that NATO would disintegrate before it was able to consider the use of nuclear weapons. Conventional improvements also demonstrate the collective will of Alliance members to make the sacrifices necessary to ensure Western security, thereby adding to the credibility of NATO's overall deterrent posture. Finally, conventional enhancements would bolster the self-confidence of NATO nations and ensure that the Soviet Union remains unable to intimidate or coerce Western Europe in order to obtain political, economic, or military concessions.

Our deficiencies in the conventional area are well recognized within the Alliance and important steps have been taken -- with more planned -- to correct the most serious of these deficiencies. In recent years, NATO has made considerable progress in conventional force modernization, including the deployment of a variety of new weapons systems: the Tornado, F-15, and F-16 aircraft; the M-1, Challenger, and Leopard II tanks; the Patriot and Roland air defense systems; the AH-64 and AH-1 attack helicopters; the multiple launch rocket system; new infantry fighting vehicles; and the NATO AWACS. The procurement by several NATO nations of the Multiple Launch Rocket System (MLRS), and the purchase of components to provide links for the Battlefield Intelligence Collection and Evaluation System (BICES), Joint Tactical Information Distribution System (JTIDS), and TR-1 high altitude reconnaissance aircraft will help to locate, target, and strike with conventional weapons the operational maneuver groups, reinforcing echelons, and reserves of the Warsaw Pact before they can reach our defensive positions. Finally, the U.S. and European nations are pursuing a number of cooperative efforts encouraged by the Nunn-Warner Amendment, including the NATO

frigate replacement program, the anti-tactical missile system, and a family of surface-to-air missiles.

The past several years of resource appropriations has not gone unnoted in European Command. Today, each of the U.S. service components in the European theater is stronger and more capable as a direct result of the early 1980s defense programs. Our ground forces, for example, have benefited from the deployment of new tanks, armored fighting vehicles, artillery, and attack helicopters. The Abrams M1A1 tank has three times the mobility of its predecessor, with greatly improved crew survivability and firepower with a 120mm smoothbore main gun. The Bradley infantry fighting vehicle provides the mechanized infantry units in Europe with mobility equal to the Abrams tank and, by virtue of its 25mm cannon TOW missiles, and coaxial machine gun, possess substantially more firepower than the systems it has replaced.

The Multiple Launch Rocket System (MLRS) is another key element of our ground force modernization process, one that will provide an important capability for the implementation of NATO's Follow-on Forces Attack and chemical retaliatory concepts. The AH-64 Apache attack helicopter is also a welcome addition to our forces in Europe. It is armed with Hellfire missiles and a 30mm chain gun, and is faster, more robust, and more lethal than the Cobra attack helicopter it is replacing.

The Patriot air defense system now being fielded in Europe will be the centerpiece of the theater's air defense network. Its quick reaction capability, high firepower, and electronic warfare countermeasures are features not available in the systems Patriot will replace. Additionally, Patriot offers the capability to simultaneously track and engage multiple targets.

These five programs are representative of our commitment to update the land combat forces in theater. General Galvin hopes

that we will be able to continue this progress and look forward, in particular, to the development of the Army tactical missile system (ATACMS), advanced anti-tank systems, fire-and-forget weaponry, and a badly needed new forward area air defense system.

There has also been progress in the modernization of our tactical air capability in Europe. Our newest aircraft (F-14s, F-15s, F-16, and F/A-18s) are more maneuverable and equipped with more advanced sensors and weapons systems than their predecessors, the F-4s. Deployment of future systems such as the upgraded F-16 fighters and the F-15E all weather attack aircraft will provide further improvements that will exploit our technological advantages in aviation technology over our adversary. We are also capitalizing on new technologies in the beyond-visual-range targeting capability that a large proportion of our aircraft in theater now have in the form of the Navy's Phoenix missile and the joint Navy/Air Force medium range AIM-7M Sparrow. It is important that this capability be expanded to include all aircraft by fielding the AIM-120 Advanced Medium Range Air-to-Air Missile (AMRAAM) system.

Another priority in coming years will be development of integrated navigational target location and identification devices for our aircraft. Progress in these areas has already helped the Navy and Air Force to increase the number of aircraft capable of operating at night or in adverse weather. Some of these planes rely on internal sensors; others will eventually be equipped with a new pod-mounted system under procurement by the Air Force called LANTIRN -- for Low Altitude Navigation Targeting InfraRed for Night Flight. This device will enable aircraft to fly at low altitude and beneath cloud cover at night to find and attack targets.

To reduce the current intra and inter-theater airlift

shortfall, the C-17 cargo aircraft remains a high priority item. Though smaller than the C-5, the C-17 will be able to carry the full range of military equipment, including all our armored vehicles. Its maneuverability on the ground and its takeoff and landing profiles will allow it to land in more forward areas than the C-5 and to augment the C-130 in an intra-theater role.

Several naval programs are important to our theater capabilities. The completion in 1987 of the FSS roll-on, roll-off ship program has increased the ability to reinforce Europe with fast sealift. The construction of LHD-1 amphibious lift ships--each of which will be able to carry nearly 2,000 Marines, as well as 42 CH-46 helicopters, assault craft, and large amounts of cargo -- will provide the increased lift needed for the Marines committed in Europe.

Over the past several years, the ability of our command, control, communications, and intelligence systems to support our operational forces has increased as well, through the deployment of new systems. These systems, and others still programmed for fielding, will enable us to get the most from our joint and combined warfighting capability, and will also provide the key systems to identify and target the adversary's follow-on forces. The Joint Tactical Information Distribution System (JTIDS) will make it possible for our fighting units to exchange battlefield information using digital communications among tactical units. Communications for tactical commanders will be improved as well by the Ground Mobile Forces Tactical Satellite Communications Program, which will provide a series of multi-channel, highly survivable, anti-jam ground communications terminals in the mid-1990s. Mobile Subscriber Equipment will provide units with the field equivalent of a secure commercial telephone system, while the Single Channel

Ground-Airborne Radio Systems (SINCGARS) will soon provide anti-jam secure combat-net, very high frequency radios to replace obsolescent systems now in use.

Emphasis should also be given to the continuing efforts to develop a robust theater intelligence capability, another area in which we may be able to apply Western technology to offset somewhat the Soviet and Warsaw Pact numerical edge. In this regard, continued support is essential for key program such as our Theater Intelligence Architecture Program and its associated Joint Intelligence Center, the Joint Tactical Fusion-Limited Operation Capability Europe intelligence automation system (JTF-LOCE), the all source Battlefield Information Collection and Evaluation System (BICES), and the Joint Tactical Fusion Program in Europe. Together, these systems will improve the collection, fusion, and dissemination of intelligence to the battlefield commanders. And when linked with the attack and command and control systems I have discussed, these intelligence programs will provide the capabilities that are needed to make the Follow-on Forces Attack concept a reality.

Readiness and Sustainability of Our Forces

We all recognize that it is one thing to update our weapon systems but quite another to ensure that they will be supported sufficiently to conduct extended combat operations. Thus, I would like to stress the continued need for a balanced program of readiness and sustainment improvements. This is particularly important in the case of our forces in Europe, elements that occupy forward defensive positions and might have to fight heavily outnumbered against the attacking echelon of the Warsaw Pact.

In addition to the progress in NATO's weaponry, mentioned

previously, we have been greatly assisted by new Allied agreements to provide for reception, onward movement, and other logistical support that will be needed by deploying U.S. forces. We have made progress also in obtaining host nation assistance. We are now in the implementation phase of a program through which 93,000 West German reservists are dedicated to accomplishing U.S. support requirements.

The 1984 decision by NATO to double the size of the common-funded infrastructure program to over $10 billion for the period 1985-1990 also has been a step forward. This increase is providing urgently needed facilities, including hardened shelters at reinforcement airfields, theater reserve storage warehouses, ammunition storage facilities, and upgrading of airfields and naval bases. The commitment by NATO's Defense Ministers to raise the level of ammunition stocks should also improve readiness in coming years, and Alliance acceptance of the long term planning guidance for Follow-on Forces Attack (FOFA) is a promising development.

With your support, the readiness and sustainability programs that were jointly prepared by the Services and CINCs will enable U.S. forces to maintain marginally acceptable levels of support. While General Galvin would prefer higher levels, we have made some substantial progress in recent years. We have increased the fill of our POMCUS stocks. We have received funds -- with this committee's support -- for essential upgrades to better manage our prepositioned equipment and the reception and onward movement of U.S. reinforcements. And we have drawn closer to delivery of the C-17 transport aircraft. Our preparedness for the reinforcement of Europe has improved substantially as well, largely due to recent increases

in the levels of Wartime Host Nation Support to be provided by our allies and the recent Collocated Operating Base (COB) agreements that make European airfields available to U.S. reinforcing air units during wartime -- and thereby greatly reduce the number of aircraft at any one base while complicating Soviet plans.

We remain, however, unable to meet fully our reinforcement commitment to NATO. This is the result of continuing shortages in a number of interrelated areas: readiness and availability of support units; POMCUS fill; strategic lift; theater war reserve stocks of preferred munitions, equipment, spare parts, deployable medical systems and medical supplies; availability of warehousing to support prepositioning and other theater storage programs; and host nation support. Each of these items must be addressed. Because they are so closely related, efforts to make improvements in one area often yield true dividends only if accompanied by progress in others. Increases in our POMCUS stocks, for example, must be accompanied by increases in warehouse space necessary to store those stocks. On the other hand, greater POMCUS fill can decrease our need for strategic lift that would otherwise be needed to carry equipment from the United States. In short, we must be constantly alert to the interrelationship among various capabilities as we work to improve the overall posture.

I hope Congress will preserve the progress made during the past few years of emphasis on readiness and sustainability programs. Warsaw Pact forces deployed against the Central Region of NATO have sixty to ninety days of operational spares and supplies forward deployed. Our own stocks in Europe do not compare. Serious shortages remain in certain ground-to-air munitions, high technology surface-to-surface rounds, and antiradiation missiles, and in the readiness of support

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forces. They are compounded by continuing shortfalls in the areas of strategic sea and airlift. It is crucial that we improve our existing levels of readiness and sustainability.

Taking Proper Care of Our People

A key part of the readiness picture is the individual Americans who have volunteered to serve our Nation. I know you are committed to taking proper care of our soldiers, sailors, airmen, and marines, and their families, by providing them adequate compensation, medical care, housing, and family care. We must also ensure reasonable working, living, and recreational facilities. And of great importance as well, we must afford them the satisfaction that comes from rigorous training, from being a part of an ably-led team, and from knowing that their country and its civilian leadership truly care about them.

I do not need to remind you that our young men and women in uniform serve with loyalty and discipline so that their countrymen may live in peace and security, or that our troops often make sacrifices that would be intolerable in the private sector. They accept these sacrifices willingly, and take pride in helping defend our country and our way of life. Recent budget cuts have already forced us take a number of difficult steps: to extend tours overseas; to delay promotions; to divert some troops from training to base operations activities; to reduce family support programs, child care facilities, libraries, and recreation centers; to cut funding of morale, welfare, and recreation facilities and activities; and to delay or cancel needed Department of Defense Schools construction. To offset the budget cuts in funding of morale, welfare, and recreation activities, we have had to close facilities, reduce staffing and increase recreation center

rates by 25%.

Troops in Europe have also had to contend with a falling dollar, which over the last two years, has cut in half their discretionary income. One small but important example illustrates the effect of the dollar's slide: two years ago a twenty minute phone call to distant families in the United States from Germany cost $35; today, with no increase in German telephone rates, that same important call now costs over $80. Additionally, we have had to raise the price of many Army-Air Force Exchange System catalog items by 15-20%, and impose youth activities user fees. For many of our junior enlisted personnel, a tour to Europe has become even more of a sacrifice than it was in the past. New funding reductions would compound the effect of the decline in the dollar and could have a very adverse effect on the morale and efficiency of our service members and their families, making our retention efforts more difficult than they have been since the late 1970s. We should not allow further reductions in currently funded people programs. I strongly urge your full support in this necessary area.

Military Construction

Military construction is a necessary component to support both our fielded nuclear and conventional weapon systems and to provide an important contribution to taking proper care of our service members. Additionally, modernization of existing, deteriorating facilities and new construction is a very visible signal, to Allies and adversaries, of U.S. continued presence in European Command' area of responsibility. Nowhere has the negative impact of the decline of the dollar been felt harder than with military construction. Let me explain. In general, MILCON projects are identified and associated costs established at least two years in advance. Many MILCON projects in this FY

89 budget were developed by the Services in 1986, initially forwarded to Congress in 1987, and are now under your review for execution in 1989. A three year process. Despite efforts to keep the costing data current, the dollar will not buy in 1989 what it would have bought three years ago in 1986. For example: a $300 million MILCON program, cost at an exchange rate of $1.00 to 2.06 DM, authorized and appropriated by Congress, will cost today, at a rate of $1.00 to 1.70 DM, an additional $63.5 million to construct that program. This shortfall will necessitate either project cancellation or deferral until sufficient additional funds are provided to handle this shortfall. In either case, CINCs are in a Catch 22 position with our service personnel and their families the ultimate victims.

For FY 89, European Command construction requirements in Europe total just under $1.1 billion. This represents our validated needs and we ask for your full support and assistance in insuring sufficient funds are authorized, and appropriated to ensure these projects actually come to fruition.

Burdensharing

As I have proceeded to identify the key European command requirements associated with the FY 89 budget, I have also attempted to highlight several of the significant contributions that the other Alliance members are making toward our shared commitments to NATO.

While all nations of the Alliance can do more, and General Galvin addresses this issue with Alliance nations on an almost daily basis, the collective nations do contribute more than is commonly understood. No single set of indicators can tell the whole story, but let me share with you a few indicators which

are not widely known.

When one looks at defense expenditures since 1971, one finds only three countries do not exceed the United States in average annual defense budget growth. Of the 2.6 million men on active duty in Europe, the Europeans contribute 2.3 million. In terms of equipment, the Europeans provide 80% of the combat aircraft and tanks and 70% of the fighting ships. Of the 14 million men in the Alliance who would be mobilized for war, the Europeans would provide 10 million.
At the same time, our European hosts absorb enormous political and economic costs involved in the stationing and training of large number of foreign troops. The Federal Republic of Germany and the United Kingdom provide 20 billion dollars of real estate, free, to the Alliance. Additionally, Germany, the size of Oregon with the equivalent of 25% of the U.S. population, hosts over 5,000 annual exercises and suffers through in excess of 580,000 annual military aircraft flights; many noisy flights are conducted at very low altitudes.

In sum, the European Allies make a substantial contribution to the collective defense, more than for which they are often given credit. Still, both they and we need to do more, and not just in terms of spending. We will all have to strive for a more coherent approach to virtually all aspects of the common defense and the U.S., as the acknowledged leader of the Western world, should be prepared to bear the costs associated with that leadership.

Possible Alternatives for Improving Conventional Defenses

Your staff proposed several that are of interest to the Subcommittee for discussion at this hearing. As you will see, some of the issues are not necessary initiatives, and have been around for many years. The following paragraphs give you a

quick status on them.

Improve Procedures for Crisis Management

A good idea. We are working on this in close cooperation with our NATO allies.

Use of Barriers and Mines

Strategically placed barriers and mines are well recognized ways to improve defenses. We are currently working on new technologies to increase our capabilities in this regard.

Establish Multinational Battalion

Combined operations is a good idea, but establishment of multinational battalions will be largely cosmetic, and may be a battlefield detraction. Continued emphasis should be placed on integrated warfighting at the ATAF/ARmy Group level and above.

Extended Air Defense/Anti-Tactical Missile Capability

EUCOM recognizes there is a threat from Tactical Ballistic Missiles, now and in the future. In response to that threat, and at the request of VCJCS, EUCOM developed and submitted a general European ATM requirement statement In addition, the US Army is sponsoring a Targeting the Tactical Ballistic Missile (TTBM) program, aimed primarily at counterforce efforts against TBMs.

Conventional Standoff Systems

EUCOM continues to explore the requirement for highly accurate air- and sea-launched conventional standoff weapons.

Create a Command Covering Force

This already exists in several areas with stationing of cavalry regiments on the border. If the intent is for one nation to provide a covering force in another nations' GDP

area, then the same problem encountered with multinational battalion will exist. Therefore, it would not be the preferred option.

Establish a NATO Training Center

An excellent idea which will be partially implemented in the future. At this time, maneuver space is a limiting factor, but additional space is being sought.

Create a SACEUR Ammunition Reserve

At this point, emphasis should be on getting nations to meet their individual minimum ammo requirements. Emergency in War procedures give NATO commanders some flexibility in redistributing ammo to meet military needs during combat.

FOFA

FOFA is a key contributor to the NATO Triad, and is recognized as such by US and NATO military authorities. Programs that support FOFA enjoy EUCOM priority.

War Gaming Crossfeed with Allies

USAREUR and USAFE recognize the value of war gaming crossfeed with Allies. Currently we and the Allies do combined war gaming at Warrior Preparation Center, and we plan to expand future opportunities for Allied participation in the program.

Conclusion

In conclusion, as we face the challenge of funding a prudent level of deterrence, we must not accept solutions that unreasonably increase the risk to Western security or reduce our commitments to Allies and friends. American forces are deployed in Europe because it is in the U.S. national interest to do so. Those forces must be maintained and supported in a manner that allows them to face with confidence the Warsaw Pact

forces deployed on the borders of NATO.

There are no easy solutions for the challenges we and our European Allies face in deterring Soviet aggression and intimidation in Europe. I am confident, however, that our strategic approach, so successful in the past, remains correct. Our collective challenge is to ensure that the Alliance has sufficient military capabilities to fulfill the dictates of our strategy and maintain the peace in Europe, for the first time in modern history, for more than a single generation. U.S. forces in Europe will be able to do that with the resources that the Secretary of Defense has requested in his FY 89 Defense budget. On behalf of General Galvin, I ask for your continued support of America's commitment to the European theater as you examine improved conventional defenses in Europe.

NATO'S ALERTING SYSTEM

Senator LEVIN. Thank you very much, General. Ambassador Woodworth, Ambassador Abshire has testified that NATO needs to strengthen and perhaps revise NATO's alerting system. Are you familiar with that recommendation?

Ambassador WOODWORTH. I am familiar with his general recommendation on that, yes.

Senator LEVIN. And can you tell us what changes, if any, that you believe need to be made in the NATO alerting system?

Ambassador WOODWORTH. Well, first let me emphasize that the improvement of crisis management in the alert system, of course, is a continuing priority goal of NATO. We have been working closely with the NATO authorities to automate the alliance's alert management system. And this, among others, is one thing that we want to carry through.

We are also giving attention to the use of warning time, and the relationship between the alerts system and national actions that are needed to support reinforcement.

As you know also, all of the NATO nations conduct an annual review of the alert system with the goal of improving the system, and support the major NATO commanders' annual conferences.

In general, we are looking at this overall issue and I do not want to go beyond that unless you have anything you would like to add.

General FIALA. I would only comment that we recognize the need in a crisis for adequate warning time. Our intelligence community

understands the types of operational actions that are required on the part of the Warsaw Pact that would precede an attack, either a preemptive attack or a deliberate attack. We are confident of our ability to detect preparations for attack in Central Europe.

NATO, on the other hand, recognizes the need for a credible, publicly usable intelligence to permit and support early subjective decisions on their part so that they can proceed in making timely decisions. All, I believe, appreciate the difficulty of building consensus among the NATO member nations. All nations support efforts to improve those efforts for crisis management.

DEFICIENCIES IN NATO'S CONVENTIONAL POSTURE

Senator LEVIN. Thank you. Ambassador, I think you noted in your testimony that the Conventional Defense Initiative action plan called on NATO military authorities to develop highlighted force goals for the members of the alliance designed to help correct critical deficiencies in NATO's conventional posture. You have also noted that the member nations agreed to make a special effort to implement the highlighted force goals in full.

Would you provide this subcommittee, for the record, with those highlighted force goals and a description of how the members of the alliance have done in meeting them?

Ambassador WOODWORTH. I will do that.

[The information follows:]

CONVENTIONAL DEFENSE INITIATIVE (CDI)

During the fall of 1987, nations submitted their second annual reports regarding planned implementation of NATO force goals, including the CDI highlighted force goals. Major force improvement areas addressed by the CDI highlighted force goals and general examples of requested improvements are depicted in Chart 1.

Overall, the allied response to the highlighted CDI force goals has been positive. The non-U.S. allies, as a group, plan to accomplish a large number and wide range of required improvements. There are, nevertheless, substantial differences among countries. The larger nations [deleted] report plans to implement a high proportion of their CDI highlighted goals. [Deleted.] Chart 2 arrays the non-U.S. allies according to their implementation performance (with the best performers at the top and the worst at the bottom) and summarizes key shortfalls in CDI implementation.

CHARTS 1 AND 2

[Deleted.]

HIGHLIGHTED FORCE GOALS

Senator LEVIN. You have also noted that the United States has sought to set an example for other nations by making every effort to achieve full implementation of its highlighted force goals, and that those force goals received a high priority in the fiscal year 1989 request. Can you tell us what programs related to these highlighted force goals were cut in the process of amendment to the 1989 request, and also tell us which of those highlighted force goals remain unfunded and unbudgeted in the 1989 request?

Ambassador WOODWORTH. In order to do that, could I provide that for the record?

Senator LEVIN. Is there anything that stands out in your mind that you would like to comment on now?

Ambassador WOODWORTH. I would rather reserve on that and provide that for the record if I could.

The information follows:]

CDI HIGHLIGHTED FORCE GOALS

Recognizing the importance of the CDI highlighted force goals to the alliance's conventional force posture, we made a special effort to ensure that the 1989 budget amendment—while maintaining a balanced U.S. defense program—contained a level of funding for programs related to the highlighted force goals that was sufficient to enable us to continue our record as one of several nations at the top level of compliance with the NATO highlighted goals.

The United States has always endeavored to set the example for other nations by allocating sufficient funding to ensure implementation of a high proportion of our highlighted force goals. The fiscal year 1989 budget submission contains the essential conventional force improvement programs to allow us to continue this high level of performance. No DOD programs related to the CDI highlighted force goals were unfunded or unbudgeted in the fiscal year 1989 amendment.

It is important to recognize that the current force goals over the period 1987–1992 and that most goals specify achievement by 1992, the end of the NATO planning period. Thus, overall compliance depends not only on the fiscal year 1989 budget amendment, but also on the allocations that will be provided in the fiscal year 1990 and fiscal year 1991 budgets.

Senator LEVIN. You have also said in your prepared testimony that one area of particular concern in view of our focus today is allied performance in implementing CDI highlighted force goals. Are the European allies meeting their highlighted force goals as well or better than we are?

Ambassador WOODWORTH. In general, let me try to characterize it this way, as we have evaluated that, as it has progressed so far. The allies who are making the strongest contributions to alliance defense, in general, are on average achieving a higher percentage of progress on highlighted force goals.

To some extent, not surprisingly, those nations which have been, relatively speaking, contributing less to alliance defense in terms of their overall contributions and budgets, have been less successful in meeting those goals. Some of the countries in fact, I think as a general proposition, have been doing effectively better than we have. But——

Senator LEVIN. What are the countries with the poorest implement rates?

Ambassador WOODWORTH. In general, Denmark is one. I would like to mention others, but I do not want to state them specifically without reviewing them.

TERRAIN PREPARATION

Senator LEVIN. General, for several years I have been promoting terrain preparations as a way to improve our conventional defenses, and Ambassador Abshire specifically recommended that the alliance do more in this area as well. Can you tell us what we are doing in the area of barriers and mines?

General FIALA. As you know, Mr. Chairman, from an operational point of view, terrain preparation is a very real part of a defensive alliance. And, therefore, the alliance is vitally interested in all types of improvements. What has also driven the alliance, as the various modernization programs have developed, has been to develop a strategy that allows the installation of barriers and mines in

areas that can be used not only in defensive operation but also in reinforcing counterattack options. Therefore, each attempt that is made to improve the use of barriers and mines has to be taken in that context.

There are a large number of U.S. NATO study efforts ongoing at the present time, always ensuring that what is developed is integrated into the defense plan and covered with appropriate forward deployed forces, because any type of an obstacle, if not covered by some type of a force, really can be removed at the leisure time of the attacker.

In many ways, as Western Europe has developed since the World War II time frame, the large urban sprawl that has developed has aided in the assistance of developing natural barriers. There are a variety of Army and Air Force programs that continue to be developed which offer great promise in the future in allowing the operational strategy for NATO in its defensive context to be implemented with more skill.

Senator LEVIN. Other than developing a lot of plans and programs, what are we doing in the area of terrain preparation? Are we running into continuing opposition from the Germans? Have they agreed that there should be these kind of passive barriers, restraints, underground pipe or whatever, or not?

General FIALA. To answer that question with the detail that I believe you need, I have to provide the data in the record, because it will involve some classified information.

Senator LEVIN. Do you have anything to say on that, Ambassador?

Ambassador WOODWORTH. Only that we are discussing this whole area with the Germans and with other allies.

Senator LEVIN. What kind of timetable are we on? These discussions have been going on for some time.

Ambassador WOODWORTH. Let me do it this way. We are looking to have some results later this year or into next year. That cannot be confidently predicted, but that is something we would like to see.

Senator LEVIN. You say by the end of this year?

Ambassador WOODWORTH. Possibly. These are ongoing discussions and they will develop.

Senator LEVIN. I know they are ongoing, but at some point we need a resolution. We either have to insist on it, give it up, or do something with it.

Ambassador WOODWORTH. It is very hard to pin down and predict exactly when this will bear fruit, but the timeframe I am giving you is at least one timeframe that we have hopes for.

Senator LEVIN. How much is terrain preparation part of our military planning?

General FIALA. As the alliance is a defensive alliance, it is a tremendous part of the preparation for defense.

Senator LEVIN. Do we have dedicated forces whose primary responsibility is terrain preparation?

General FIALA. Yes, sir.

Senator LEVIN. Can you give us for the record the extent to which we have those forces?

General FIALA. Yes, sir.

[The information follows:]

TERRAIN PREPARATION

Dedicated forces to perform terrain preparation include 11 combat engineer battalions (four Divisional and seven Corps combat) and five combat engineer companies (two Regimental, two Divisional forward, Berlin Brigade). In peacetime these units, in coordination with maneuver commanders and GTA, develop obstacle plans (to include detailed target folders) for execution in crisis or war in accordance with central region barrier agreement (CRBA) and NATO alert system. At [deleted] materials and munitions are moved to vicinity of obstacles. At [deleted] divisional engineers move forward and begin obstacle preparation and survivability operations (digging positions for critical fighting and communications systems). Corps engineers also move forward in direct support of divisions to perform these tasks. Capability to perform terrain preparations will be enhanced by new equipment to be fielded to USAREUR. These are: Volcano Mine Dispensing System—fiscal year 1991, Tactical Explosive System—fiscal year 1991, Armored Combat Earthmover—fiscal year 1991.

Senator LEVIN. And what about—I am going to have to adjourn here for about 10 minutes. I have to vote. When Senator Quayle comes, he could reopen it. He could start again if he gets back before I do. Excuse me for 10 minutes.

[Recess was taken at 1:35 p.m. for a vote; the hearing reconvened at 1:51 p.m.]

Senator LEVIN. Sorry for the long interruption. General, you made reference to a closed session. Maybe you could share with us additional information on discussions with the Germans on barriers. I do not think we are going to have a closed session. Would you submit to us in classified form what you are making reference to. You could just give it to us in classified form, and we will keep it that way.

General FIALA. Along with the forces available to prepare barriers, your earlier question, we will also provide you the status.

[The information follows:]

TERRAIN PREPARATION

Terrain preparation is always part of a commander's defense plan. Given sufficient time, engineers can prepare complex barriers, using mines, wire and antitank ditches to impede the attacker's thrust and render him more vulnerable to a defender's fire.

Unfortunately, time rarely permits engineer troops to prepare both survivability positions and antitank barriers. [Deleted.]

U.S. and allied military planners have been working to correct this situation and to exploit the very real advantages complex barriers would provide NATO forces against Warsaw Pact aggression. [Deleted.] The U.S. Army is developing new mine and barrier technologies that will permit us to prepare antitank obstacles that are unobtrusive until actually needed and, when executed, are very effective in canalizing or blunting an armored attack.

[Deleted.]

Senator LEVIN. I presume that is classified too?

General FIALA. Yes, sir.

MULTINATIONAL BATTALIONS

Senator LEVIN. That will be fine. Let me ask both of you a question about multinational battalions which I have been proposing now for at least a year or so as a means of strengthening deterrence. Let me describe the concept to you first.

The proposal is that we establish at least one multinational battalion in each corps sector. The battalion would operate the same type of equipment as operated by the nation that has assigned

forces in the corps. In other words, the multinational battalion in the U.S. Seventh Corps area would operate U.S. equipment, and the U.S. Army would be responsible for providing total logistics support.

The multinational battalion would fall under the operational control of the host corps sector. The steps that I have outlined would minimize the management problems that multinational battalions would otherwise pose to our military leaders.

The benefit of these multinational battalions is in the area of deterrence. An attack in any sector of the central front would cause the loss of lives of every member of the alliance. There would be no attack that the Warsaw Pact could launch which could be designed to politically divide the alliance.

In other words, an attack in one area is an attack in fact, as well as according to our doctrine and policy, on all of us. You have already adopted a policy which says that it is an attack on all of us. But this would in fact put our troops in the way, troops of all of us. And that may give a lot more confidence to each of us that we are in the soup together and might deter the Soviets from thinking they could divide us politically by attacking in just one corps area.

First, Ambassador Woodworth, would you comment on that proposal?

Ambassador WOODWORTH. Well, Senator, your explanation is helpful to me. Frankly, I am not familiar, and was not familiar before, with your ideas and concepts for this. It is true, as you suggest, that if one had a multinational battalion that was associated and integrated into one nation's corps, that that would help to alleviate some of the most obvious kinds of problems that would otherwise seem to exist, which have to do with the standardization of equipment, training, and logistic support, or even command and control.

The other useful thing to me, from your explanation on this point, is that the major purpose in your concept is to increase deterrence. In a general sense, I think that probably, if there is anything to be served by this, it would probably be in that sense, because it is not clear to me how doing this as such would increase military capabilities.

On the question of whether it enhances deterrence, I do not know. I would want to think about that. But just thinking out loud with you for a moment, it seems to me that if there was a question about whether one or another nation could be divided from its allies as a result of a particular kind of Warsaw Pact attack, I'm not sure that putting certain of its forces in the way, or a small number of forces, in another location would change the equation for that nation. If, in fact, it were inclined to be separated, if you will, from the alliance in responding to an attack, I think the decision would be taken on a larger basis, really.

Senator LEVIN. Do you think public support for an American response to a Soviet attack in Norway would be greater if American boys were killed in that attack?

Ambassador WOODWORTH. It's hard to say, Senator. I don't know.

Senator LEVIN. Is it possible?

Ambassador WOODWORTH. It's impossible to say.

Senator LEVIN. No, I'm saying, is it possible that public support would in fact be greater for an American response to a Soviet attack in Norway if American boys were killed in that attack?

Ambassador WOODWORTH. I understand the question.

Senator LEVIN. I am saying, is it possible that popular response would be greater? That's all I'm asking. I know it shouldn't make any difference, maybe in a theoretical world. My question is, in a real world is it possible that our public would be more determined to respond, whether theoretically they should be or not?

Ambassador WOODWORTH. I suppose it's possible, but I would like to think that the commitments we have made would be fulfilled without that.

Senator LEVIN. I would hope so too. It is the possibility that the public support for a response would be greater, would add an uncertainty to the Soviet planner.

Ambassador WOODWORTH. It's possible. I would like to think about it. But again I'm still inclined to think that what is going to impress the Soviets more is really other kinds of cooperation within the alliance.

Senator LEVIN. Do you oppose the French and German cooperative venture?

Ambassador WOODWORTH. No.

Senator LEVIN. The battalion?

Ambassador WOODWORTH. No.

Senator LEVIN. Or the brigade?

Ambassador WOODWORTH. No.

Senator LEVIN. Do you see any advantage militarily to that brigade, or psychologically, which is part of the equation?

Ambassador WOODWORTH. It strikes me that the special circumstances surrounding that brigade seem pretty compelling. I'm not sure they transfer necessarily to other cases.

I think we are all familiar with certain of the political and, indeed, historical reasons that underlie the motivation to form that brigade. I think they have more practical motivations as well, you know, as those two countries look at it. But I am not sure that those unique set of circumstances which led to that brigade easily transfer to other cases.

Senator LEVIN. Do you have any comment on that, General?

General FIALA. I agree with what Ambassador Woodworth has said. From an operational point of view, the multinational battalion gives all of the nations difficulties in that soldiers have to be trained in the appropriate language of that country.

Senator LEVIN. You're talking about a battalion?

General FIALA. Yes, the battalion idea. They have to learn the language. They have to train and then be able to train with that nation's equipment, some of which will be different. And all of the nations which are involved have to have some kind of support system for them, with some kind of agreement that the support systems are there.

Senator LEVIN. Is that what the French and the Germans are doing?

General FIALA. Yes, sir.

Senator LEVIN. They are learning each other's language?

General FIALA. Yes, sir, making a very real effort to ensure that they can speak each other's languages. Selection of the people involved in that brigade will be a very careful process. So you give us some rather difficult attack options. And when you talk about the employment to get the forces of all nations, then we have one example where that already exists. That is in the ACE Mobile Force Land, where it is a composite of seven nations' combined forces. If they moved to the flanks, as a SACEUR has the capability to move them to the flanks wherever they're needed, they become a part, then, of whatever happens.

Senator LEVIN. Do you know if they share common equipment and logistics?

General FIALA. No. As a matter of fact, the United States provides some forces. Each nation has to provide their own support structure. So it is a complex, difficult force.

Senator LEVIN. It's a different one than a multinational?

General FIALA. Putting a multi-battalion together, let's say, well, instead pick an infantry battalion in the ACE Mobile Force. If you put every nation into that force, it would complicate the training and support markedly.

Senator LEVIN. There is no doubt there's a complication on the training side of it. The question is whether or not the symbolism and the psychology add a real deterrent, and add a real boost to morale.

I mean, we've talked to people who have been in these partnerships that exist between various forces when they visit each other, live with each other, for a while. It really is a terrific boost to morale. And everyone that I've talked to who has participated in this, who has served with the Germans or served with Brits, or whatever, are very high on what they are doing and on this idea. The soldiers like the idea of learning to use the other, the allies' equipment—and by the way, that would be a real boost to interoperability—and also, look forward to serving with their colleagues in other countries. This is a real morale booster and a unifier. In an alliance this has got value.

The question is whether or not the additional complications that it provides for training, it is not as simple obviously, but whether or not that it is overcome by these other values. Let me close——

Ambassador WOODWORTH. Senator, if I could just add, it is helpful to think of those kind of ideas. I don't want my reaction to imply in any sense a closed mind to the idea. We should think about that, and I think it's a good idea to do that.

Senator LEVIN. Thank you very much. Senator Quayle.

Senator QUAYLE. I just have a few questions for the other panel.

Senator LEVIN. Well, as I understand it, these folks are here to answer these questions. Ask if you would these people. We are not going to have a separate panel as I understand it.

Senator QUAYLE. Oh, I thought we had a separate panel.

Senator LEVIN. They are just here to backup in case you need backup. The Army, as I understand it, has designated this panel to answer your question, which they have a right to do. But we have a right to say we want backup witnesses to ask. Because we don't want to tell the Army who it is that should represent their views on any subject any more than we want to tell any other agency.

We don't pick the representative of the agency to represent the agency's views. But we have a right to get witnesses to answer our question. That's the balance that was struck here. So the Army has a right to give us their position, and then we have a right to ask anybody that is here as a witness whatever questions.

Whatever the understanding was with the Army, I want to maintain. General Wall and General Capps, would you please join us. And then apparently the understanding was that the questions need not be asked first of the Ambasssador or General Fiala.

EXTENDED AIR DEFENSE

Senator QUAYLE. My issue is on extended air defense. And I think General Wall and General Capps are the ones that are most knowledgeable. If the Ambassador wants to answer, or the General, fine. I have no problem with that.

Senator LEVIN. General Wall is the one designated by the Army. I was wrong. So you can just address the question to General Wall, and I will pick up with these other two later.

Senator QUAYLE. Okay. Can I ask General Wall my question?

Senator LEVIN. Absolutely.

Senator QUAYLE. Thank you Mr. Chairman.

Senator LEVIN. Well, we tried to work this out fairly with everybody here. I think any agency of government, again, has a right to say who is going to represent their view, and apparently General Wall is representing the official Army view. Is that right?

General WALL. Sir, that is not completely correct. As a matter of fact, in the extended air defense and the things that Senator Quayle is interested in, I have really worked with General Capps in this area. You've got a three star working for a one star, because my mission pertains to active missile defense, research and technology development and that portion of BMC^3 that applies to active missile defense.

Senator LEVIN. Is anybody going to speak officially for the Army?

General WALL. Yes, sir.

Senator LEVIN. Who is speaking for the Army today?

General WALL. General Capps is the man in charge of the tactical missile defense program for the Army.

Senator LEVIN. And he is speaking officially for the Army?

General WALL. Yes, sir.

Senator LEVIN. Very good. If you could address your question. You want to obviously, but I would like to get the ground rules down here first.

Senator QUAYLE. Okay. So on extended air defense, I think my question should go to General Wall or General Capps.

General WALL. Yes, sir.

Senator QUAYLE. Let me just ask a couple of general questions and get this going. I'll tell you, I'm just interested in getting the testimony out, and the discussion, and hope that the chairman is likewise. Because this whole issue of extended air defense, I think, is important. Last year we had legislation in the Senate and the House dealing with what we're going to do on extended air defense. The Senate version was a joint service program, and the House

with a different version. I want to find out exactly how we should do it, what your recommendation is for doing it this time. But first I have a few general questions. General Capps, do you have an opening statement?

General CAPPS. Sir, I have a briefing that I put together. It is somewhat long, and probably does not fit within the time lines. We could come back some time. Also, it could get into classified information. So if you would allow us to come back some time and, in detail, brief you on that, we would like to do that. But I am prepared to answer your questions.

Senator QUAYLE. I don't think we have time to come back. This is it. Is there something you could submit for the record, a short briefing?

EXTENDED AIR DEFENSE IN A POST-INF ENVIRONMENT

My interest is that I want to establish the need for extended defense in a post-INF environment. Let me just ask that question, and maybe you can incorporate some of your briefing. That's my first question. I want to establish what is the need, and what are the requirements, and what we perceive we ought to be doing in extended air defense in a post-INF environment.

General CAPPS. Okay. As you know, sir, the post-INF threat has somewhat changed from the pre-INF threat, where we were talking about pre-INF SS–21s, SS–12 Mod 2s, and the SS–23, and the short-range ballistic missile world. The SS–23 and the SS–12 Mod 2 have gone away. However, the SCUD and SS–21 problem remains. It has always been there, and we didn't focus on that initially, because it is being replaced by the SS–23. Indications are that the Soviets are doing some things to improve the range and accuracy of the SCUD.

If you look at pre-INF to post-INF, the friendly target set that was in range of the Soviet or Warsaw Pact short-range ballistic missiles, it will not have changed significantly. If we had say 500 targets or whatever in range before, we still have 80 percent of our friendly assets vulnerable to the short-range ballistic missile threat post-INF.

In addition, we have no limitation on the Soviets developing a short-range ballistic missile with a range of 500 kilometers. So, if you add the 500 kilometers back to that equation, essentially 100 percent of all the targets that were in the range of the short-range ballistic missiles pre-INF, post-INF are essentially the same.

The threat therefore has not changed that much. It still should be looked at, however, in the context of the total air threat. The short-range ballistic missiles are only one component of the Soviet integrated air ground operation, primarily used initially in the initial attack to gain advantage or to put some of our air defense assets at risk and to perhaps attack our command and control nodes. So pre-INF, post-INF, there is not much change in the total threat.

BALLISTIC MISSILE THREAT

Senator QUAYLE. So in other words, you focussed on ballistic missile threat primarily, speaking of the SCUDs there. It's still essentially the same because the targets and the ranges they are capable

of hitting are key assets as they were before, and they will be able to afterwards. So, therefore we still have a serious threat, particularly from the ballistic missiles. Is that correct?

General CAPPS. Yes, sir.

SOVIET CRUISE MISSILE THREATS

Senator QUAYLE. What about the future Soviet cruise missile threat?

General CAPPS. Sir, you cannot look at just one aspect of the total Soviet air threat, and where it is today and where it is in the future. You have to look, again, at the total air threat. That includes their aircraft, not only their offensive but defensive aircraft and their close air support aircraft, their helicopters which include both attack helicopters and their standoff jammer capabilities. In terms of missiles, their air-to-surface missiles would certainly include cruise, anti-radiation missiles, and short-range ballistic missile threat. So if you look at the total air threat, that essentially defines it.

Now, where are they going with all of that? I think there will be improvements in Stealth technology, improvements in warheads, smart guidance systems, improved conventional munitions. In the tactical ballistic missile world, there will be improvements in accuracy and in types of conventional warheads.

Senator QUAYLE. Does anybody want to add or subtract from what General Capps has said?

General WALL. No, sir. I would just amplify that General Capps is quite correct that we have 80 percent of the targets still at risk when they improved the SCUD 1Bs. And even if they didn't, they're all in that short-range. Very profitable targets for the Soviets are in that short-range.

And I would amplify two other things. One of them is that the Soviets did build the SS–20 with the 5,000 kilometer range, just under the 5,500 kilometers. I think they will do just that under the 500 kilometer limit-A new missile.

And the other thing is that extended air defense does include attack helicopters, cruise missiles, ballistic missiles, and so forth.

General CAPPS. I might add, Senator, that this is a very multifaceted problem and needs a multifaceted response. We are looking at the subject of extended air defense in terms of what we need to do about it. And we have developed a joint operational concept that has four concept elements: active defense, passive defense measures, counterforce or attack options, and the command and control structure that goes with it. That is a joint service concept approved recently by the Joint Chiefs of Staff.

The Joint Chiefs of Staff have also developed a joint operational requirements statement that puts a contextual or a conceptual framework around how the war fighting commander deals with the tactical ballistic missile and also the total tactical missile threat. So, those two documents are in being now.

I have recently completed a 1-year effort looking at the tactical missile problem as a director of a Special Task Force which was a Joint Service Task Force. And we agree with the concept of active, passive, counterforce, and command and control structure that goes

with it. That's how the tactical missile problem has to be addressed.

FUEL AIR EXPLOSIVES

Senator QUAYLE. Have you looked at the fuel air explosives capability of knocking out the aircraft shelters?

General CAPPS. Yes, sir.

Senator QUAYLE. What kind of emerging threat is that?

General CAPPS. I think very significant, sir.

Senator QUAYLE. Fairly significant, or very significant.

General CAPPS. Very significant.

Senator QUAYLE. My time is up.

Senator LEVIN. We will keep going.

ACTIVE DEFENSES

Senator QUAYLE. Okay. Besides the PAC–2, what are we going to be doing in the future and what needs to be done as far as active defenses? I look at active defenses beyond some of the things we should do in passive defenses, hardening and things of that sort. Do we have a road map of where we might be going beyond PAC–2?

General CAPPS. Sir, part of the program plan we've put together was a road map beyond the active defense side. The program plan was completed by the task force I needed. It is out now for staffing among about 50 different agencies who will comment on it. And once we get their comments we will publish this as an Army/Air Force joint master plan. We'll get it through the Army and Air Force as far as concurrences are concerned, and then to the Joint Chiefs of Staff for their consideration. So, yes we do have a road map for the future.

Senator QUAYLE. I presume, is that classified?

General CAPPS. Yes, sir. And in the near term, as you know, we are going to field the Patriot PAC–2 system. We were planning in fiscal year 1989 to initiate a number of actions. Of course, we had the same problem that everyone else did in the services, with the fiscal year 1989 amended budget submission. We had in the fiscal year 1989 original budget about $85 million worth of things to do. We cut that down to about $31 million in the amended budget submission.

EXTENDED AIR DEFENSES

Senator QUAYLE. Do we have an operational requirement for extended air defense?

General CAPPS. Yes, sir. I mentioned that earlier, that the Joint Chiefs of Staff on March 12 published a Joint Operational Requirements Statement which is kind of an umbrella document that gives the war fighting CINC a conceptual framework in which we would attack the tactical missile problem.

Senator QUAYLE. Let me ask you specifically about legislation that we had last year, an amendment that I intend to introduce for legislation this year. I'd like to do it the way the Senate did it last year, and that is take the $50 million from all the services, direct it to OSD, and have OSD turn around and establish the Army as the

lead service on this, as compared to taking it out of SDI and putting it into the Army. Which way would you prefer?

General WALL. I would prefer the first way. It's a joint program. It should be that, supported from OSD in a joint system like that. I think that's the way to go.

Senator QUAYLE. Ambassador Woodworth, do you have an opinion on it?

Ambassador WOODWORTH. I would want to talk with our acquisition and program people before making a judgment on that.

Senator QUAYLE. Could you talk with them and let us know?

Ambassador WOODWORTH. Okay.

[The information follows:]

We are in full agreement with the position expressed by General Wall that the $50 million should be taken from all the services, directed to OSD, and then provided to the Army as the lead service on Anti-Tactical Missiles (ATM). However, we would also expect SDIO to proceed with its work in the area of defense against shorter-range tactical missiles as part of its overall charter to address defense against ballistic missiles of all ranges. SDIO's efforts involve both contracting activities and cooperative programs. As an example of the SDIO effort in this area, we cite SDC's work on behalf of SDIO involving allied contractors in the Theater Defense Architecture Studies (TMDAS). We view the efforts by the Army and the SDIO on addressing the matter of defense against ballistic missiles as complementary and not mutually exclusive.

Senator QUAYLE. Thank you, Mr. Chairman.

EXTENDED AIR DEFENSE

Senator LEVIN. Thank you very much, Senator Quayle. Just a couple of questions on priorities, as to how the extended air defense fits into our priorities. As I understand it, there is no specific program, General, in the budget for extended air defense. Is that correct?

General CAPPS. No, sir. That is not correct. We do have what has been called the Anti-Tactical Missile program (ATM), Program Elements 63302 Alpha.

Senator LEVIN. Is there a piece in the 1989 budget request?

General CAPPS. Yes, sir.

Senator LEVIN. How much is in there for extended air defense?

General CAPPS. Under the ATM program there is $31.5 million.

Senator LEVIN. How much was there in the 1988 budget?

General CAPPS. $26.5 million.

Senator LEVIN. And how was that identified? What's the line in the budget?

General CAPPS. It's PE 63302 Alpha, sir.

Senator LEVIN. Is the Army seeking additional funds for extended air defense above what is in the request?

General CAPPS. Sir, I mentioned that the fiscal year 1989 amended budget request was some $50 million less than what we had originally intended to ask for. As I said, the Army had the same problem everybody else had, when we had to take those large cuts. There are a number of unfunded things we would like to do.

Senator LEVIN. Well, there are a number of unfunded things that we'd like to do too, that we are looking at. Maybe General Fiala, he is on the ground out there, how does this compare for instance to trying to fix the anti-armor issue we heard about yesterday?

General FIALA. I would say we helped develop a JCS requirements statement. So, it is a matter of high priority in the European Command. As to its direct competition with funding for anti-armor, I am not prepared to comment today. We could provide a response to that later.

[The information follows:]

BARRIER AND ANTI-ARMOR SYSTEMS

Concerning relative priority of barrier and anti-armor systems, both support USAREUR capability to delay, disrupt, and defeat first and second echelon attack. Relative merits of both are well founded and relative priority at tactical and operational levels is situationally dependent. USAREUR requires and supports initiatives that provide both capabilities.

COMBAT SERVICE SUPPORT

Senator LEVIN. What about combat service support in Europe? Do we have what we need there for combat service support units, or are we short?

General FIALA. That's a very complex question, because there are so many different types of combat service support needs. The CINCEUR has been very vocal in his concerns for adequate combat service support forces. And with any detail as to where he feels the shortages are, we have to provide that.

[The information follows:]

COMBAT SERVICE SUPPORT

Combat power of forward deployed four and two third divisions and total NATO capability available in Central Army Group will make it very difficult for first echelon Soviet forces to succeed. In the Army in Europe there is a total strength limitation of about 220,000. Within that, it is our judgment that keeping the combat forces as large as possible is the best mode for achieving deterrence. Divisions have been structured so that organic combat service support is able to fight for about seven days. That means that as long as division forces are reasonably tailored in accordance with this organization they can fight seven days before we need the nondivisional support. With that in mind, it is our assessment that we have taken an acceptable risk by keeping our combat force high with a relatively small tail ratio.

Senator LEVIN. I think that what we ought to do is get some statement from the Army as to where this all fits with other priorities, because it's obvious that it is a legitimate need here. But the question is, what is the Army's view in terms of a number of other things that they have indicated to us at least at various times they need.

I don't know which General to look at, or who to look at for this information. But can one of you get the official position of the Army on the combat service support issue, on the armor/anti-armor fix issue, and any other of their priorities that they would like to see added to the budget request? I'd like to get some idea from the Army, because some of these things, I am hoping to fix. I mean, I hope we can address some of these in the markup. If this is a high priority with the Army, I want to know it, because it's important to us. It's a legitimate need, and we should know what the priorities of the Army are. So it's, maybe General Wall, I guess you are probably, what——

General WALL. I will take that back to the proper person and get you that answer, sir.

[The information follows:]

ARMY PRIORITIES

The Army response was provided under separate cover. A copy follows:

DEPARTMENT OF THE ARMY,
OFFICE OF THE CHIEF OF STAFF,
Washington, DC, May 23, 1988.

Hon. CARL M. LEVIN,
Chairman, Subcommittee on Conventional Forces and Alliance Defense, Committee on Armed Services, U.S. Senate, Washington, DC.

DEAR MR. CHAIRMAN: This letter responds to your request for a statement concerning priority programs the Army would like to see added to the fiscal year 1989 budget request, which you made during the 14 April 1988 hearing on Budgeted and Unbudgeted Alternatives for Improving Conventional Defense in NATO, including Air Defense.

The President's Budget reflects the Department's funding priorities, and the Army supports the President's Budget. Today's Army has achieved tremendous momentum in its ability to meet the essential warfighting requirements of the Commanders in Chief (CINCs), and the programs presented in the fiscal year 1989 budget are adequate to maintain that momentum, at least in the short run.

The Army recognizes that resource constraints affect the entire Defense Department. Were additional funds to be made available to the Department, the Army's recommendation would be that priority be given to programs that enhance CINCs' critical warfighting capabilities and improve essential readiness and sustainability.

In the armor/anti-armor area the Army's priorities would be to accelerate procurement of M-1A1 tanks (which in turn accelerates redistribution of M-1s to replace M-60s in the Reserve Components), pursue growth in Hellfire missile effectiveness, buy more Hellfire and TOW 2 stocks to provide at lease two combat loads per system, and to continue procuring Apache.

To enhance the readiness and effectiveness of our combined arms team, we would exploit our night advantage over the Soviets by procuring additional night vision devices, accelerate procurement of Bradley Fighting Vehicles to more closely match M1A1 fieldings, continue the 120-millimeter mortar program, and enhance combat training center instrumentation.

To offset asymmetries in counterbattery capability and respond to the United States Commander in Chief, Europe (USCINCEUR) priority on follow-on forces attack (FOFA), the Army would recommend procurement of additional multiple Launch Rocket System (MLRS) launchers and rockets and Army Tactical Missile System (ATACMS) munitions.

In the air defense area, the Army would accelerate fielding of the pedestal-mounted Stinger (PMS) system to forward-deployed forces, and retrofit Chaparral missiles with improved seekers.

To ensure our continued ability to attract and maintain a quality force, the Army would correct fiscally-driven junior enlisted promotion slowdowns, fully fund its noncommissioned officer (NCO) requirements, construct additional hardstands in Europe for vehicle maintenance, and fund central supply, transportation, and depot maintenance operations to avoid civilian work force reductions and sustain critical readiness support to Army field forces.

Improvements also would be sought to fix the problem of Reserve Force Combat Support/Combat Service Support (CS/CSS) readiness. A listing of where additional funds could be used in this area was provided to the Chairman of the Subcommittee on Readiness, Sustainability and Support under separate cover on 18 April 1988.

The challenge in determining budget alternatives is always to balance the availability of resources among scores of legitimate claimants. The Army sought to strike such a balance in our fiscal year 1989 budget request, as did the Department of Defense. Continued support for the President's fiscal year 1989 budget at its current level is critical to the Army's priority efforts to maintain essential force readiness and protect essential sustainability—both of which demand no further reductions in force structure—and to continue modernization at a pace that is slower than originally programmed but still cost-efficient.

Your interest in and support of the Nation's requirement for strong, capable conventional ground forces are deeply appreciated.

Sincerely,

ARTHUR E. BROWN, Jr.,
General, United States Army,
Vice Chief of Staff.

Senator QUAYLE. You might want to get OSD involved in that, Ambassador Woodworth, to try to give us a priority on this. Also, I think what you want to probably do is to look now in the short-term and long-term things too. There are some short-term needs, but there are also some long-term needs that we need to address, and if we can get sort of a mix on that, because this is more in the long-term area. It is difficult to judge, but I think it might be helpful.

[The information follows:]

All of the items you mentioned—extended air defense, anti-armor, and combat service support—are a matter of high priority for DOD. Overall, our current priorities are reflected in the fiscal year 1989 amended budget, which seeks to maintain a balanced defense program in the face of current fiscal restraints. We are now engaged in preparing our budget for fiscal years 1990–91. Throughout this process, we will continue to aim at a balanced defense program.

Senator LEVIN. Well, whatever guidance we can get, I agree with Senator Quayle. We do want to hear from OSD as well as the Army on this. But we are going to try to fix some things in the markup of this subcommittee. And we are not going to be bound, obviously, by what OSD tells us. But we sure would like to hear from them and the Army as to what some of their priorities are here. I don't want to limit you to those three areas. But those are three areas at least that the full committee is looking at. We are looking at a number of those on this subcommittee. So can both of you get back to us?

Ambassador WOODWORTH. We will do that.

General WALL. Sir, could I return to an earlier discussion regarding money for extended air defense. I would just like to emphasize that General Capps and I are close partners. I was serious when I said that I work for him, because I do leverage SDI resources to try to support his efforts in areas related to extended air defense. Let me clarify this. As the Executive Agent for SDIO, my command is helping the SDIO in fulfilling its Presidential Charter to ". . . develop technologies to defeat missiles of all ranges . . ." by continuing to support theater missile defense programs. We are presently involved in architecture studies, hardware experiments, and development of the theater test beds, as well as lethality, survivability, and threat analyses. In fiscal year 1987 from General Abrahamson's budget, SDI put approximately $70 million into the theater missile defense or extended air defense related research. In fiscal year 1988, about $90 million is being invested for this purpose. Not all of this work meets the needs of General Capps, however, in terms of building a complete defensive structure in any theater. As General Capps has already mentioned, the Army, as the DOD lead service, is charged with the development of a complete system to meet the Joint Chiefs of Staff operational concept that includes active defense, passive defense, counterforce, and battle management elements. SDIO/SDC theater missile defense program efforts contribute only to the active defense technology base and a portion

of battle management systems. Shortfalls exist in terms of providing a near-term capability, e.g., upgrade of Patriot and in counterforce, passive defense and BMC3 systems. In conclusion, I would fully support Senator Quayle's initiative to set aside money, $50 million, from the services and to direct it to OSD for use by the Army and therefore, General Capps, for extended air defense purposes.

Senator QUAYLE. Thank you, Mr. Chairman. I don't have any other questions.

ESTABLISHING A COVERING FORCE FOR NATO

Senator LEVIN. Thank you, Senator Quayle. Ambassador Abshire's study on improving conventional defenses in NATO recommends establishing a covering force for NATO. His concern, as I understand it, is to create a force available to the Supreme Allied Commander to plug holes in our forward defense until the national armies would move to their forward defense positions. Has the Department reviewed this concept? If so, what position have you taken on it?

Ambassador WOODWORTH. The general idea, of course, is not from Ambassador Abshire. I am not sure we've taken a systematic look at it. I know it has been discussed. We haven't been entirely sure what is intended here.

There are covering forces in our current force structure, which General Fiala can, I am sure, address in greater detail and authority than I can. The problem is to try to understand more fully just exactly what might be proposed here, and how it might be used. But we are aware of that, and we have no position on that, I don't believe, that I'm aware of at least.

Senator LEVIN. Can you give us the position for the record?

Ambassador WOODWORTH. We can certainly do that.

[The information follows:]

We appreciate the constructive intent of this proposal. However, covering forces are already in existence in the United States corps areas in the Center Region and in most of the other corps areas. The two U.S. armored cavalry regiments (ACRs), for example, constitute "screening and covering forces" which are currently deployed in critical areas, already forward of other stationed forces. The capability to deploy them farther forward early in a building crisis already exists in the NATO alert system, that is, they could be passed to SACEUR's command under a measure of Simple Alert. The critical element will be the "political" decision to commit the covering force, not the existence of the force.

If the intent of the proposal is to create a truly multinational covering force under SACEUR's operational command in peacetime, this would raise all the additional problems noted in connection with multinational battalions, i.e., problems regarding standardization of equipment, training and logistic support, and command and control. Regarding the latter, it is doubtful that any nation would be willing to forego peacetime command of its contingent of such a force. In crisis or war, the need to obtain command "chops" from all nations represented in the multinational covering force would compound the difficulties.

[Deleted.]

Senator LEVIN. Do you have anything to add on that?

General FIALA. I would only comment that as the Ambassador said, there exist covering forces for each of the NATO corps areas. And there are contingency plans that have been developed by the NATO commands to meet the covering force requirements should

the national forces not be deployed, their own covering forces not be deployed in sufficient time.

The question you have to ask is, if the plans exist now to cover the requirement, and if you develop some type of alternate by doctrine, by mission design, is the system of the covering forces an integral part of the deployed corps, whatever that is, a British corps, a German corps, or an American corps. And if you mix those forces by putting another type of another nation there than the corps deploys, then you have to mix the national forces. Normally, that would just create some of the other additional problems that we talked of, with the multinational battalion.

If these contingency plans were not there, then I would say yes. But from an operational point of view, we believe that the NATO structure does have the capability to meet the requirements. And of course should the NATO alliance desire to create these, this type of command covering force, certainly SACEUR has it within his authority to do that, just as he created the ACE Mobile Force Land that all the nations have to subscribe to.

Senator LEVIN. Has the NATO alliance looked at this proposal?

General FIALA. I cannot comment.

Senator LEVIN. Is it because——

General FIALA. I really don't know.

Senator LEVIN. Can you find out whether this concept has been proposed at NATO, and if so, what the response is. If it has not been proposed, can you maybe ask General Galvin to put it through the appropriate pipe lines so that we can get a response on it?

General FIALA. Yes, sir.

[The information follows:]

COVERING FORCE MISSIONS

Questions on covering force missions are continually addressed by the nations in NATO. From a theater perspective covering forces are by mission, design and doctrine properly assigned to national corps. Their employment is an operational decision. If SACEUR and his subordinate commanders, within NATO context, desire to create a "Command Covering Force" as a result of hostilities, it is within their authority to do so. From a command perspective, AFCENT is subdivided into specific national corps of operations. Doctrinally, within each corps area, there is a covering force. For example, covering forces are already in existence in the United States corps areas. The two armored cavalry regiments (ACRS) constitute "screening and covering forces" which are currently deployed in critical areas, forward NATO also has contingency plans to compensate for late arriving corps which preclude the need for development of additional alternatives.

Senator LEVIN. Have you seen Abshire's study?

General FIALA. I have seen parts of it.

TRAINING CENTER FOR NATO

Senator LEVIN. You might take a look at that part of the study. It relates to this as a starting point. He's got a lot of experience on it. General Fiala, let me ask you a question about a training center. Last year the Armed Services Committee endorsed the idea of a training center for NATO, which would be patterned after the National Training Center at Fort Irwin, California.

Now that training center has various battalions from U.S. Army units transport their equipment to that fort where they spend 3

weeks in highly sophisticated combat maneuvers against forces that simulate Soviet combat tactics and training. I am told that it's the finest training of its kind anywhere in the world.

The idea of a NATO training center would be to have a location where a U.S. battalion and a battalion from an allied country could engage in combined operations side by side against a dedicated operations force simulating Soviet tactics. Is there any kind of a training center like that in Europe today?

General FIALA. No, Senator, there is not. We agree with your assessment that the National Training Center is a tremendous success in what it allows to the units, and how it stresses and trains units that deploy to it. I believe you are also aware that NATO has a continuing search for suitable training areas where air and ground forces can train together.

But what I would add, while that search continues, and has continued for a number of years in a variety of countries, to develop a NATO training center patterned after the technology of the National Training Center would be exceedingly difficult, because what makes the National Training Center go is that everyone who goes there has the same type of weaponry.

If you go with the sophistication associated with the MILES equipment at a NATO training center, and you change the type units that go in—a couple of weeks U.S. and German following maybe Dutch and German, maybe Dutch and Belgian—you will have to change all of the instrumentation because they have different offensive weapons systems which have to be measured. And so the complexity of putting one of those together in that kind of context is exceedingly difficult.

Senator LEVIN. Isn't that a more realistic effort, though, than what we have now?

General FIALA. What NATO desires is to find territory large enough and suitable enough so that it can train forces, air and ground forces together, without——

Senator LEVIN. Side by side in combined operation?

General FIALA. Yes, sir.

Senator LEVIN. So you are looking for that?

General FIALA. Yes, sir, there has been a continuing search for a number of years by a European NATO training group.

Senator LEVIN. And how is that different from what I just described?

General FIALA. I do not believe any of the plans take into account the high intensity measurement, weapon-on-weapon system that is in the National Training Center, because of the complexities that I mentioned.

Senator LEVIN. But isn't that kind of training a more realistic simulation of what might happen in Europe?

General FIALA. Yes, sir. But the costs would be huge.

Senator LEVIN. Are you talking about a dollar cost?

General FIALA. Yes, sir.

Senator LEVIN. What would those costs be? Do you have any idea?

General FIALA. To automate all of the various types of weapons systems that all the NATO countries have, to come to that training

area, exchange those out each time units from different nations came in, would be very, very expensive.

Senator LEVIN. Has there been a cost estimate of this?

General FIALA. I cannot comment on that.

Senator LEVIN. We think it wouldn't be as costly as you have just described, since it is just the receiver gear. We think the cost wouldn't be as high as you have indicated.

One of the problems would be a political cost, to have weapons compared. And a lot of countries may not like to have their own weapons compared with other countries' weapons. That's a different kind of cost than you are referring to though.

General FIALA. That already happens in some of the NATO competitions where weapons systems are compared.

Senator LEVIN. So would you see if there is a cost estimate as to how much that kind of a training center I just described would cost us?

General FIALA. A National Training Center type instrumentation system suitable for use by the NATO nations?

Senator LEVIN. Right. If it hasn't been estimated what that cost is, would you try to give us an estimated cost? If it is a very complicated, or very difficult thing to give us a ball park figure on that, assuming it hasn't already been done, let us know. We don't want to put you through a very complicated task, unless we know that we're doing it.

[The information follows:]

General FIALA. While we continue to look at the feasibility of some sort of alliance training center, no specific proposal has been developed for consideration by NATO. Without a specific proposal to what is already a very difficult and pragmatic issue, any generalized discussions are premature.

Senator LEVIN. Gentlemen, we thank you all. Apparently there is another rollcall. Rather than try to recess briefly, we will adjourn. We will have additional questions for the record. Perhaps a number of my colleagues that couldn't be here may ask questions also. We appreciate all of your coming by. Thank you.

[Questions for the hearing record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR DAN QUAYLE

UNDERFUNDED REQUIREMENTS

Senator QUAYLE. You indicated that there were unfunded requirements for extended air defense for fiscal year 1989. What are these unfunded requirements?

General CAPPS. The Extended Air Defense Program is designed to counter the Soviet tactical air and missile threat through passive countermeasures, attack operations, active defense, and command and control. A significant tactical missile threat will exist even after the Intermediate Nuclear Forces Treaty is ratified eliminating missiles with ranges greater than 500km. The results of an Army led Joint Tactical Missile Defense Special Task Force to address near-term and long-term programs for defense against tactical missiles further support a need for an ATM capability even with the Post INF Treaty. The findings indicate that increased capabilities are needed in all four TMD elements.

The EAD program is addressed in two phases: near-term and long-term.

Near-term provides active self defense capability against the non-nuclear portion of the threat by modifying existing Patriots. It also examines passive measures, additional active defense measures and counterforce options and begins product improvements of select systems to provide a phased response to the tactical missile threat portion of the engagement phase and to the TMD counterforce solution.

Long-term program provides for an overall concept for countering the total tactical missile threat. This approach will encompass all active and passive countermeas-

ures including offensive/counterstrike measures and will examine ground/airborne sensor systems, satellite surveillance, and C31 considerations. Development of new or evolutionary systems will be examined, evaluated and developed as required. Unfunded requirements currently exist in the near-term and long-term phases in all four concept elements of EAD.

Senator QUAYLE. If you had $50 million authorized for extended air defense, describe how you would recommend that it be spent.

General CAPPS. If the Army had additional funds in 1989, I would recommend that the funds would be applied toward the following areas:

Acceleration of Patriot PAC-2 to defend against existing threats (SS-21, SCUD).

Advanced Tactical Patriot development beyond PAC-2 to demonstrate and validate the capability of a modified Patriot missile that is multimission capable against air breathing and tactical missile threats.

Accelerate development of a surface-to-surface capability to destroy or disrupt TBM Launchers and/or their communications/support structure.

Continue lethality studies and experiments to define enhanced non-nuclear kill modes (new warhead and technologies) against TBMs armed with conventional, chemical and nuclear payloads.

Define an optimum architecture for the Command, Control, Communications, and Intelligence functions necessary to meet the timelines associated with the TBM threat. This effort requires joint Army/Air Force involvement in concert with our allies to integrate advancements in sensor technology associated with alert and warning, target acquisition, and cuing.

Increase work on passive defense measures to reduce vulnerability of friendly assets to tactical missile attack; e.g., signature reduction, hardening, mobility, and deception measures.

[Whereupon, at 2:35 p.m., the hearing adjourned.]

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